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ABSTRACT

These participant materials are from a videoconference that addressed the needs of adult literacy program administrators, instructors, and tutors beginning or continuing the technology implementation process. Section I contains the videoconference materials: agenda; videoconference evaluation form; biographical and program information; executive summary of the Office of Technology's report, "Adult Literacy and New Technologies"; and technology glossary. An implementation guide is designed as a basic primer, with seven steps to follow when integrating computers into instructional programs. A guide lists adult literacy software evaluation criteria. A document on Internet-based videoconference resources lists Internet resources created for the videoconference and additional resources available online that are relevant to adult literacy and provides instructions for subscribing to and accessing resources through online services and for accessing the videoconference resources through an institutional affiliation. An action planning form concludes the first section. Section II contains the following reference materials: annotated bibliography of 28 adult literacy and technology resources; annotated listing of 16 adult literacy organizational resources; information on funding resources; a 3-part guide to joining the online community; information on finding and using low-cost computer software; and CD-ROM sources of free or low-cost software. (YLB)

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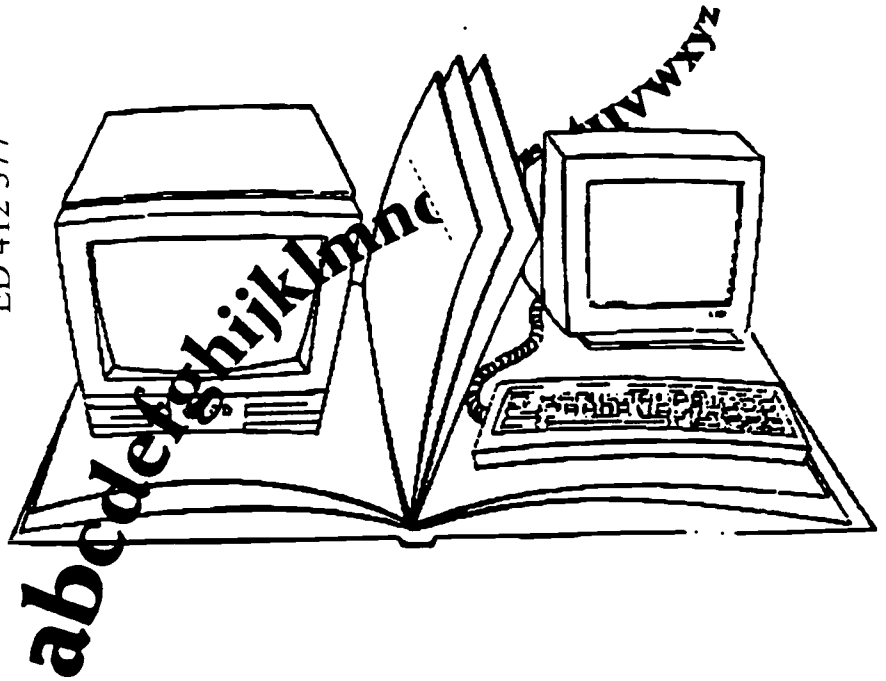

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TECHNOLOGY: NEW TOOLS FOR ADULT LITERACY

Participant Materials

April 28, 1994
1:00 - 3:00 p.m. ET

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April 28, 1994

Dear Videoconference Participants:

Welcome to the videoconference *Technology: New Tools for Adult Literacy.* We are pleased that you have decided to participate today and certainly hope that you will find the videoconference to be of value for you, your program, and of course, your students.

The videoconference has been designed to address the needs of adult literacy program administrators, instructors, and tutors. We know that the implementation of technology in adult literacy programs brings with it a host of challenges and problems. Yet, we believe that the many opportunities and resources made possible by technology outweigh these challenges. We hope that the knowledge, ideas, resources, and enthusiasm you gain from participation in the videoconference will help to move you a little further along the road to effective technology implementation.

This is the first in a series of staff development videoconferences brought to you through a partnership among the National Center on Adult Literacy, the PBS Adult Learning Service, the Office of Vocational and Adult Education of the U.S. Department of Education, the American Association of Community Colleges, and WHYY-TV in Philadelphia. Each of the partners has contributed important resources to the development and implementation of this project because of our joint commitment to finding new solutions to the adult literacy problem and belief in technology as one important set of tools to address that problem. We want also to acknowledge the generous support of the Outreach and Technical Assistance Network (OTAN) in helping to make this project a reality.

The National Center on Adult Literacy is pleased to provide for you the Participant Materials Packet. It includes a great deal of useful information and resources that will enhance your participation in the videoconference and will assist you as you begin or continue the technology implementation process. We urge you to pay special attention to the follow-up electronic networking component of this videoconference, as will be described near the end of the program. More importantly, we urge you to participate in these follow-up on-line activities.

At the close of the videoconference, please be sure to fill out the evaluation form that is in your packet and return it to the site coordinator. Not only will we be evaluating this particular program, but also other aspects of the videoconference medium, to determine its effectiveness as a tool for staff development.

Sincerely,

Joyce Harvey-Morgan
Videoconference Coordinator
Associate Director, NCAL

Daniel A. Wagner
Director, NCAL

Technology: New Tools for Adult Literacy

Sponsors:
National Center on Adult Literacy
The PBS Adult Learning Service
U.S. Department of Education, Office of Vocational and Adult Education
American Association of Community Colleges/Community College Satellite Network
WHYY TV12

Moderator:
Claudio Sanchez
Education Correspondent, National Public Radio

Special Thanks to:
Senator Paul Simon
Dr. Augusta Kappner, U.S. Dept. of Education
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Ronald Pugsley, U.S. Department of Education
State Directors of Adult Education
State Literacy Resource Centers
State Videoconference Coordinators
National Adult Education Professional Development Consortium
Tim Songer, Interactive Knowledge
Kate Gladney, Connect, Inc.

Film Footage Provided by:
Outreach and Technical Assistance Network, "Adult Literacy and Technology: The Tools"
Northwest Regional Literacy Resource Center
Project L.E.A.P., University of Mississippi
Chemeketa Community College
Salem, Oregon EvenStart Program
Office of Technology Assessment (OTA), "Adult Literacy and Technologies: Tools for a Lifetime"
Adult Literacy Instructors' Institute (ALIT)
Idaho ABE on TV

TECHNOLOGY: NEW TOOLS FOR ADULT LITERACY
APRIL 28, 1994

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TECHNOLOGY: NEW TOOLS FOR ADULT LITERACY
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Technology: New Tools for Adult Literacy
Videoconference Evaluation Form

Your comments about today's program will be greatly appreciated. Please answer all questions and return this form to your site coordinator or mail to the address below:

1. On a scale of 1-7 (with 7 being the highest), rate this videoconference in terms of its overall educational value to you:

Poor						***Excellent***
1	2	3	4	5	6	7

2. Please rate each of the following sections of the videoconference in terms of their educational value to you:

   a. Panel I - Current use of technology, benefits and obstacles to using technology, guidelines for implementing technology

Poor						***Excellent***
1	2	3	4	5	6	7

   b. Technology tools and types

Poor						***Excellent***
1	2	3	4	5	6	7

   c. Panel II - Technology implementation

Poor						***Excellent***
1	2	3	4	5	6	7

   d. Electronic networking

Poor						***Excellent***
1	2	3	4	5	6	7

   e. Question and answer periods

Poor						***Excellent***
1	2	3	4	5	6	7

3. On a scale of 1-7 (with 7 being the highest), please rate the participant packet of materials in terms of its educational value to you:

Poor						***Excellent***
1	2	3	4	5	6	7

4. What is your evaluation of the effectiveness of the videoconference medium as a tool for staff development?

Poor						***Excellent***
1	2	3	4	5	6	7

5. What one thing will you try to do as a result of participating in this videoconference?

6. What topics would you like to see addressed in future staff development videoconferences?

7. What is your current position (e.g., program administrator, instructor, tutor)?

8. Other comments (please use back of page if necessary):

Technology: New Tools for Adult Literacy
National Center on Adult Literacy
University of Pennsylvania
3910 Chestnut St.
Philadelphia, PA 19104-3111

Biographical and Program Information

Panel I

Kathleen Phillipps Fulton, Senior Analyst, Office of Technology Assessment, Washington, D.C.

As Senior Analyst with the Congressional Office of Technology Assessment, Kathleen Fulton is currently Project Director for the assessment of "Teachers and Technology," due for delivery to the House and Senate Education Committees in January 1995. Kathleen has been a principal author on the following OTA studies related to education and technology:

- *Adult Literacy and New Technologies: Tools for a Lifetime* (July 1993)
- *Testing in American Schools: Asking the Right Questions* (March 1992)
- *Linking for Learning: A New Course for Education* (November 1989)
- *Power On! New Tools for Teaching and Learning* (September 1988)
- *Trends and Status of Computers in Schools: Use in Chapter 1 Programs and Use With Limited English Proficient Students* (March 1987)

Ms. Fulton's work has concentrated on teachers' use of technology and the implications for teacher training and teaching style. She has written several articles on these issues and has made presentations to groups of educators at the district, state, and national level at many conferences and training programs. In the recent study of school testing, her area of concentration was the use of performance-based testing as an alternative to multiple-choice tests.

Prior to coming to OTA in 1986, Ms. Fulton was an analyst for the U.S. Department of Education, specializing in educational technology. She also worked for the District of Columbia Board of Education, the employee training offices in the Urban Mass Transportation Administration, and the Office of Personnel Management. She graduated from Smith College with a degree in English.

Terilyn C. Turner, Director, Ronald M. Hubbs Center for Lifelong Learning, St. Paul, MN

Terilyn C. Turner is currently Project Planning Director of the Ronald M. Hubbs Center for Lifelong Learning in Saint Paul, Minnesota. This facility, scheduled to open in the Fall of 1994, is innovative in its use of technology and design for adult literacy instruction. The Center will provide workforce literacy, family literacy, English language training, and basic skills instruction, and will use technology to link literacy service providers throughout the Saint Paul area.

In addition, Dr. Turner serves as the Assistant Director for Adult Literacy and Special Needs for the Community Education Department of the Saint Paul Public Schools and is an adjunct faculty member of the University of Minnesota. Dr. Turner received the "Educator of the Decade" Award (1991) from *Electronic Learning* magazine for her work in adult literacy and technology over the past ten years. She has also received awards from the Minnesota Association for Continuing and Adult Education (1986 and 1988) for research and development resulting from the Technology for Literacy project. In 1986, Dr. Turner received the National League of Innovation Award for her design of the ABLE Center in Charlotte, North Carolina. She is known as a speaker and author of numerous articles in the area of adult literacy and technology, including the recent NCAL technical report, *Literacy and Machines: An Overview of the Use of Technology in Adult Literacy Programs.*

Dr. Turner received her bachelor's and master's degrees cum laude from Ohio State University in Columbus, Ohio. She received her Ph.D. in Organizational Development and Instructional Studies from the University of North Carolina in Chapel Hill in 1977. She served as department head at Central Piedmont Community College prior to beginning her work in literacy. Dr. Turner has been employed as a personnel manager, training director, and currently provides consultation to businesses on literacy issues. She serves as a literacy and technology specialist for software and hardware developers, government agencies, and foundations throughout the nation.

***John Fleischman*, Director, Outreach and Technical Assistance Network (OTAN), CA**

OTAN is California's staff development project designed to support all adult basic education agencies receiving state and federal funds. As Director, John Fleischman is responsible for providing technical assistance and training for adult educators through the development of statewide resource centers, creation and maintenance of an electronic communication system, archiving informational resources, and developing a prototype for the creation of technology-supported literacy services in previously underserved areas.

Mr. Fleischman is a nationally recognized authority on the use of instructional technology for adult learners. He is a founding member of the Adult Literacy and Technology Project, a national organization that promotes effective use of technology for teaching adults. He has made presentations for the U.S. Congress regarding the role of technology in adult literacy training and has served as a trainer for numerous agencies, including the California Department of Education, California Department of Corrections, California Youth Authority, National Institute of Corrections, Brandeis University, and San Francisco State University. He has also made presentations at many state and national conferences.

As the author of numerous articles and producer of video and computer software, Mr. Fleischman is frequently asked to advise agencies and companies on appropriate design for mediated adult literacy materials. These organizations include Apple Computer, IBM, Josten's, Educational Activities, Davidson and Associates, Contemporary Books, and KCET (a Los Angeles PBS station).

Recent awards include 1990 recipient of the distinguished Al Maresh Award from the International Correctional Education Association, and the 1991 Don McCune Award from California Council for Adult Education for outstanding service in support of collaborative efforts.

Panel II

***Janet A. Bolen*, Program Coordinator, Education is Essential Foundation, Inc., Dalton-Whitfield, Georgia Chamber of Commerce**

The Education is Essential Foundation, Inc. was established in 1990 as a conduit through which business could channel its resources to address the problem of literacy in the Dalton, Georgia area. Dalton, known as the "carpet capital of the world," has had an extremely high dropout rate, sometimes topping 50%, due to so many young people going to work at the mills at an early age. The local chamber of commerce has been addressing the literacy and dropout problem since 1982 through a variety of innovative approaches. The foundation was developed in 1990 to direct attention to these now grown-up teenage dropouts, adults working in the community. The foundation's original 3-year project called for raising $300,000 and placing 25 computers in public and private adult learning centers as a step towards addressing the dropout and literacy problems and creating a learning community. At the end of 1993, over $315,000 had been raised and 41 computers were installed in three public adult learning centers, in a lab at the welfare office, and at learning centers in 11 companies.

It had become clear that in order to remain competitive in a global economy, radical changes were required of the local undereducated workforce. As the workplace became increasingly sophisticated technologically, the worker skills gap had to be narrowed. At the same time, an assessment of the adult literacy resources available in the community convinced project volunteers that a paradigm shift was required to provide the quality and quantity of adult literacy services needed. Computer-aided instruction was identified as the teaching tool with the potential to achieve that objective.

The result of this heavily computerized approach to literacy instruction is that GED completion rates in the Dalton area have nearly doubled since 1990 and dropout rates have declined from 51% to 37% over these three years. The foundation is continuing to expand its technology initiatives by loaning and donating computers, conducting job-task analysis on carpet manufacturing jobs, and developing customized software.

Janet Bolen has been Program Coordinator of the foundation since its creation. In this position, she directed and coordinated the foundation's project to introduce computer-aided instruction to adult literacy programs in public and workplace learning centers. Dr. Bolen received her B.A. from Agnes Scott College and her M.Ed. and Ed.D. degrees from the University of Georgia. Her experience includes thirteen years as teacher and department chairman of secondary social science in Georgia public schools. Dr. Bolen has presented workshops and papers at many conferences, including the America 2000 Leadership Workshop sponsored by the U.S. Department of Education, the Small Business Workforce field hearing sponsored by the U.S. Small Business Administration, United Technologies

Manufacturing Training Council, Georgia Literacy Conference, National Dropout Prevention Conference, and the U.S. House of Representatives Committee on Small Business subcommittee hearings.

Jacque O'Lea, Instructor, Adult Literacy Program, Rancho Santiago Community College

Rancho Santiago Community College is located in Santa Ana, the largest city in Orange County and the second most dense city in California. Santa Ana has an extremely young population, with its major population group 16-24 years of age. In this group, over 80 percent speak English as a second language. Thirty-three percent of the city's population have less than a 9th grade education, and 17 percent have a 9th- to 12th-grade education with no diploma. Within the Hispanic population, these figures are even more dramatic. Fifty-four percent have less than a 9th-grade education and 21 percent have between a 9th-grade and 12th-grade education with no diploma. The community served by the College is ethnically diverse and the College provides literacy instruction for approximately 20,000 students each year.

Rancho Santiago's educational programs address societal changes and how they affect learners. Because the rate of knowledge is increasing at such rapid rates and the information required to satisfactorily handle job responsibilities is changing rapidly, any educational delivery system must consider the use of technology to facilitate the frequent updating of knowledge, and students must be provided with tools for increasing the rate of learning.

The College's innovative, technology-enhanced language and literacy training program provides education in areas critical to the emerging workforce. Technology has been used successfully to attract learners, to hold their interest, to adapt instruction to their needs and levels, and to respond to multiple learning styles and multiple learners' goals and needs. Technology-based media using sound, video, graphics, and text are easily adapted for the individual learner. Making use of the auditory and visual senses and encouraging student interaction with the learning situation, technology tools provide the vehicle to decrease learning time and simultaneously increase student excitement and enjoyment of learning. Students are encouraged to determine their own learning styles and to use a variety of technological equipment, including computers, interactive laser technology, and audio- and videotapes, as well as printed materials and math manipulatives, to enhance their learning capabilities in individualized, small and large group instructional settings.

Jacque O'Lea, a member of the Rancho Santiago Community College faculty, has over 25 years of teaching experience in adult basic education, English-as-a-second-language, reading, and other high school subjects. She has a Bachelor's Degree in Spanish and a Master's Degree in Education with an emphasis in reading. She and her co-teacher Christine Pitchess have presented technology workshops and seminars throughout California; written extensively about the advantages of using technology in the classroom; consulted with computer software companies, laser disc manufacturers, and textbook publishers; written and presented programs on Educational Television Network; and hosted a technology training video for the Adult Literacy Instructors' Training Institute.

Klaudia Rivera, Executive Director, El Barrio Popular Education Program

El Barrio Popular Education Program (EBPEP) is a community-based adult native language literacy program located in one of the oldest and most vibrant Puerto Rican communities in the U.S. It began in 1985 as a research project of the Language Policy Task Force of the Center for Puerto Rican Studies at the City University of New York. In 1987 the program was incorporated as a not-for-profit, tax-exempt organization. In 1991, as a result of a national evaluation commissioned by the U.S. Department of Education, EBPEP was selected as one of nine national demonstration model programs because of its participatory approach to the education of nonliterate second-language learners. The program has been committed to teaching adult literacy to Latinos in general and Puerto Ricans in particular (currently 45% of the students are Puerto Rican, 44% Dominican, and 11% South and Central American).

The overall educational goal of El Barrio Popular Education Program is for students to develop their reading, writing, and computing skills in Spanish first, and then to apply their newly acquired literacy skills to learning English as a second language. All classes are taught using a participatory methodology; the curriculum is community-based and student-generated, validating the linguistic and literary practices of the community and using materials generated by the participants' life stories and struggles. Thus, from initial literacy, students are encouraged to write about their families, their countries of origin, their experiences as women and as immigrants, and other life experiences. The writings are then published by the program on an on-going basis. Additional program goals include (a) encouraging students and former students to play a significant role in managing and teaching within the program (currently 50% of the paid staff are former students) and (b) contributing to the self-

sufficiency of the participants and to the overall economic development of the community, through the development of student-initiated and student-run worker cooperatives (catering/food and computer) and all educational activities involving analyzing and devising strategies to address the students' and community's economic situation.

El Barrio Popular Education Program is committed to the integration of technology with native language literacy. Computers are available to the students in the program for the development of language, writing, and the computer literacy necessary for full participation in society. Computers are integrated in the literacy and ESL classes and are key to the production and development of publications. In addition, the computers are used in one of the economic development projects. Video technology is also available to program participants through workshops and the production of videos about topics that are relevant to their lives, thus helping participants to develop "media literacy" as a prerequisite to their active participation in the media community.

Klaudia M. Rivera is the Executive Director of the El Barrio Popular Education Program. She is a leader in the field of adult native language literacy and participatory/popular pedagogy in the context of community and economic transformation. She is presently engaged in the development of a critical and transformative educational model through which adult learners take control of their own organization. Dr. Rivera is also on the faculty of Bank Street College of Education and City College of the City University of New York.

Richard Sparks, Director, Adult Success Center, Idaho State University School of Applied Technology

The Adult Success Center in Pocatello, Idaho was designed to address the unique problems encountered in attempting to serve the needs of the educationally disadvantaged. The program covers the seven southeastern counties of the state, over 11,000 square miles, and serves a population base of approximately 88,000 persons over the age of 18, including 17,822 with no high school diploma. Although the majority of the instruction takes place at the Center's headquarters on the I.S.U. campus, one of the unique features of the program is taking school to the people when they can't come to school. Numerous outreach centers provide instruction at shopping malls, public libraries, grade schools, jails, state hospitals, churches, and other meeting places in the surrounding communities.

The Center participates in workplace projects, Even Start, ABE, GED, ESL, JOBS, JTPA training for adults and youth, literacy for the homeless, and the Center for New Directions (displaced homemaker, literacy tutors, and developmental education). It is the goal of the Center to give each student the opportunity to succeed. Since it has been shown that students' chances for success are dramatically increased when they find a style of instruction (or a combination of instructional styles) that complement(s) their learning style, a wide variety of teaching methods are employed, including classroom work, self-study books, audio- and video-taped instruction, and the use of interactive computer programs.

The Center integrates computer use within the regular classroom. In addition, a computer lab provides assistance to students while using interactive, multimedia information sources as well as drill and practice training on basic reading, writing, and math. Computers are used to help students prepare graphs or charts and incorporate them into reports. The Center also uses a modem and electronic mail to communicate information about commonly shared clients and attendance with community agencies. The Adult Success Center joins with the other centers in the state to provide statewide staff development through ABE on TV which is broadcast each semester over the Idaho Public Broadcasting System. The Center was a recipient of the U.S. Department of Education Secretary's Award in 1990.

Richard Sparks has a B.S. in mathematics from the University of Idaho and an M.Ed. in Occupational Training from I.S.U. He is a certified secondary teacher in four areas, vocational-technical special needs instructor, and vocational administrator. He is currently the president of the Idaho Lifelong Learning Association and a member of the national steering committee for the Literacy and Technology Project. His experiences include seven years in public schools, ten years in post-secondary applied technology as the ABE director, and five years as a businessman. His work with computer learning, interactive video, and courseware construction has been recognized nationally.

OFFICE OF TECHNOLOGY ASSESSMENT ■ U.S. CONGRESS

REPORT *brief*

JULY
1993

Technology offers new ways to boost literacy

Technology offers a promising alternative to the labor-intensive, tutorial-based teaching that makes up the bulk of today's literacy training, according to the OTA report **Adult Literacy and New Technologies: Tools for a Lifetime.**

Multimedia technologies with speech, video, and graphics offer new hope to those who have repeatedly failed in paper-and-pencil educational activities. Computer-assisted instruction enables learners to proceed at their own speed using materials relevant to their lives and tailored to their interests. Handheld electronics, such as pocket language translators, allow adults to learn on the bus or during coffee breaks—whenever they are able to study.

Telecommunications technologies are equally important. Electronic networks remove the isolation and stigma of low literacy as adults share experiences in computer-based group discussions. Closed captioning, now a standard feature in new television sets, allows learners to see and hear the words on broadcast or cable television to reinforce language and reading development. Distance learning systems bring the best teachers from around the country to the most remote learners.

All this is possible with the technologies available today; much more will be possible in the next decade. Yet the full range of capabilities has hardly been touched. OTA finds that most literacy programs have barely envisioned the educational potential offered by new technologies—fewer still have adopted them. Similarly, adult literacy applications are not high priorities for most software and hardware developers. And while Federal efforts to support technology for mathematics and science education, special education, and military training have created a base of innovative and effective applications, the technology potential for adult literacy has barely been tapped.

- In inner-city Philadelphia, adult learners and their teachers from eight community-based adult education programs throughout the city are linked via computers. The system enables students to download lessons on a wide range of subjects, share their writing with one another, and communicate with their teachers.
- In Mississippi, welfare recipients participating in the JOBS (Job Opportunities and Basic Skills) program take literacy and job-readiness skills training classes over a satellite system that reaches more than 1,000 adults in some of the most rural areas of the State.
- At the General Electric aircraft engine factory in Rutland, Vermont, employees upgrade their reading and technical skills with the help of a multimedia software system that includes text, speech, graphics, and animation, with the content built around concepts and vocabulary used in the plant.

KEY FINDINGS OF THE REPORT

- Standards and requirements for literacy have increased over time and a large number of adults needs to improve their literacy skills. OTA finds that at least 35 million adults have difficulties with common literacy tasks. Although many of these adults can read at rudimentary levels, they

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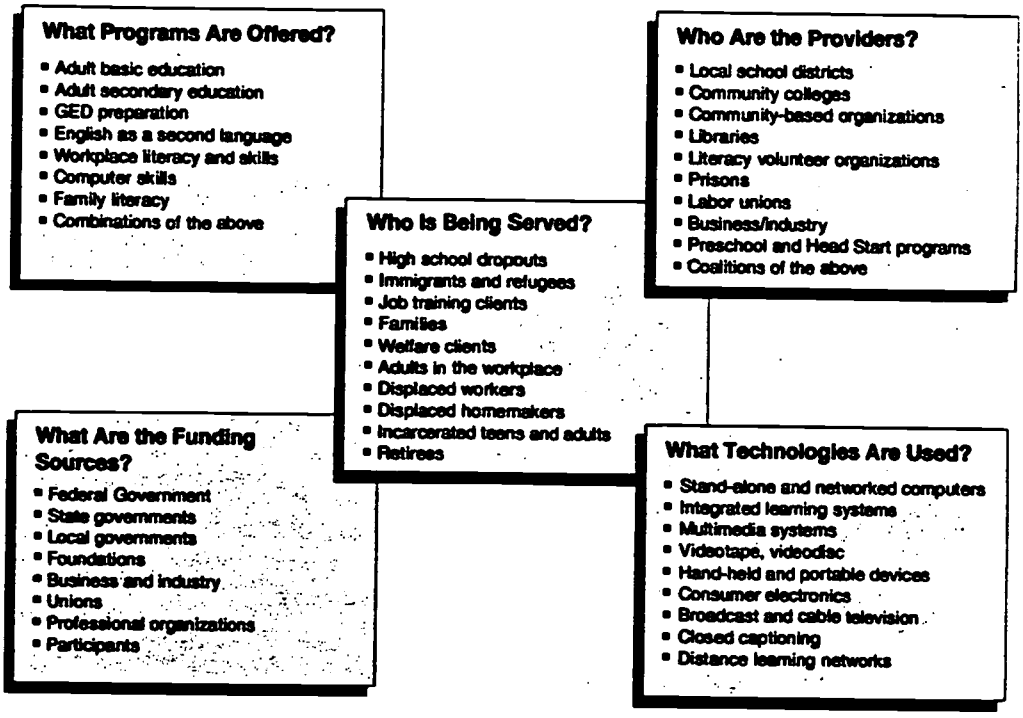
OTA REPORT *brief*

Adult literacy programs, providers, and people



The Office of Technology Assessment is an analytical arm of the U.S. Congress. OTA's basic function is to help legislators anticipate and plan for the positive and negative effects of technological changes.

need higher levels of literacy to function effectively in society, to find employment, or to be retrained for new jobs as the workplace changes.

- Adult learners have unique instructional needs that are only partly met by the patchwork of programs that provide adult literacy education. Despite a growing number of programs, fewer than 10 percent of the population in need are being reached. Even fewer are able to stay with programs long enough to achieve their full literacy goals. Services available to learners are largely a function of where they live or work, not the learners' needs.
- State and Federal efforts have expanded adult literacy programs. Although data on total funding for literacy are not available, U.S. Department of Education statistics indicate that Federal funding has doubled since 1980. Over this same period, State and local support for adult literacy has grown more than eightfold. Recognition of the importance of literacy in other programs (e.g., welfare, job training, corrections) has increased the number of agencies supporting adult literacy services. Despite this growth, adult literacy education operates at the margin and the system of services has become increasingly fragmented.
- Within this diverse web of adult literacy programs and providers, there are many common problems that technology could help overcome. For example, technology can help alleviate some of the difficulties

Common probs.

OTA REPORT *brief*

of administration, service delivery, recruitment and retention of clients, and high turnover of staff and volunteers. Electronic databases can help maintain information, track funds, and match learners to support services. Programs could use telecommunications technology to train volunteers and staff and connect them with one another to share information and reduce isolation. And technology can help programs move their resources beyond the classroom, to reach learners wherever they are.

- Despite this potential, technology for both learners and programs is not being exploited, and significant barriers inhibit wider and more sophisticated uses of technology. No more than 15 percent of literacy providers use computers regularly for instruction, and many do not use them at all. Much of the available software offers drill-and-practice rather than creative applications; many products are geared to children and are not motivating to adults. Few literacy providers have sufficient technology for broad sustained use. Staff and volunteers have limited knowledge and training in the use of technology as a teaching tool.
- Consumer electronics and broadcast technologies are surprisingly underused given their familiarity and availability. Even with the explosion in cable, public, and commercial channels and widespread ownership of television sets, only a handful of video programs target adult literacy. Common electronic devices, such as home video game machines, are largely ignored as technologies for literacy.

OPTIONS FOR CONGRESS

OTA's report presents several options that would significantly expand use of technology and increase the opportunities for adult learners within the existing system of adult education and beyond. Examples of these options include:

- *Eliminating impediments to the use of technology* in existing laws and regulations, adding new provisions explicitly encouraging technology, and enacting directives for interagency cooperation on technology planning and use in literacy-related programs.
- *Providing funds for hardware and software acquisition* directly through new Federal grants to local literacy programs, and leveraging this Federal investment by requiring matching local, State, or private funds and by encouraging community-wide technology planning and cooperation across Federal programs.

PHOTO BY: JEFF HEGER

Workplace literacy training

OTA REPORT *brief*

- *Stimulating development of adult literacy software and programming* through an initiative that encourages public/private partnerships among literacy educators, State agencies, software developers, and telecommunications providers, similar to the approach taken by the Star Schools Program for K-12 distance-learning activities. High-priority needs could be identified, such as English as a second language, high school completion, workplace literacy, materials for learners with very low literacy skills, and programs designed to reach both adults and young children in family literacy contexts.
- *Expanding training and professional development opportunities* for literacy staff and volunteers through technology such as telecommunications and distance-learning networks. By encouraging the major literacy-related programs (e.g., Job Training Partnership Act, Adult Education Act, Head Start, and JOBS) to pool their expertise and share the costs of development and technology, limited program resources could go further. Support for teacher and volunteer training and certification in adult literacy could thus be increased.
- *Encouraging experiments with personal electronic learning devices, telecommunications networks, and multimedia systems.* This should be a priority within the adult literacy research community (e.g., the National Institute for Literacy and the National Center for Adult Literacy) as well as other educational research initiatives. Congress could also include adult literacy as a priority area for new advanced technology initiatives.

Copies of the report for congressional use are available by calling 4-9241.

Copies of the report for noncongressional use can be ordered from the Superintendent of Documents, U.S. Government Printing Office, S/N 052-003-01330-4, $16.00 each, P.O. Box 371954, Pittsburgh, PA, 15250-7954, (202) 783-3238.

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Glossary of Technology

Bit - A bit is the most basic unit of information on a computer, comprised of either a 1 or a 0. All other information stored on or used by the computer is comprised of combinations of bits.

Byte - A combination of 8 bits. One byte represents a single letter, symbol, or number between 0 and 9. Hard disk capacity, floppy disk capacity, and RAM memory are measured in thousands of bytes (kilobytes), millions of bytes (megabytes), or billions of bytes (gigabytes).

CD-ROM (compact disc - read only memory) - CD-ROM technology is identical to the technology used to make music compact discs. The only difference is that CD-ROM discs are also used to store large amounts of computer information in addition to (or instead of) digitized audio. CD-ROM discs typically hold approximately 660 MB of computer software–a very large storage capacity compared with the 2MB of storage available on an average microcomputer diskette. CD-ROMs are often used to store and deliver programs that include graphics, digitized photographs, digitized video (stills or full motion), and digitized audio, because digital video and audio require extremely large amounts of storage space–far more than any floppy disk and most hard drives contain.

CGA (color graphics adapter) - CGA was the first standard developed for outputting color text and graphics from IBM and IBM-compatible computers. CGA video adapters are capable of displaying 2 or 4 colors from a selection of 16 colors at low resolution on monitors compatible with CGA. CGA was superseded by (in this order) EGA, VGA, and SVGA video adapter cards.

Closed Captioned Television - Closed captioning is a system where the learner can read on screen what individuals in a television program or video are saying. Dialogue and sound effects are rendered into a text representation concurrent with the action on screen. Closed captioning was originally developed for the hearing-impaired; however, it has been shown to be an effective teaching tool with adult basic education students. Many television programs in the United States are closed captioned. These captions can be seen only on televisions having a "decoder chip." Since July 1993, all televisions sold in the United States include a "decoder chip;" older televisions maybe be outfitted with an external "decoder box." Some videotapes include closed captions that are useful in adult basic education.

CPU (central processing unit) - Another name given to a computer. CPU usually denotes the box which contains the microprocessor, power supply, hard drive, and disk drives.

Digitized Audio - Digitized audio is the process of recording natural sounds (i.e., spoken words, acoustic instruments, etc.) in a format which computers can read and replay. Digitized audio is used to provide a clear "soundtrack." Programs using digitized audio allow the student to hear a human voice that has been recorded in a sound studio and then converted to a digitized signal that can be stored on a diskette, a hard drive, or, most frequently, on a CD-ROM. Students using these programs hear a very clear human voice giving directions, reading a passage of text, pronouncing vocabulary words and their definitions, or any number of other applications. Audio is typically played through headphones or speakers.

Diskette - Diskettes are a convenient, portable storage device. The most commonly used diskette in the early phases of microcomputer use were 5 1/4 inches in diameter and were "floppy," that is they were stored in a lightweight, flexible plastic envelopes. They typically stored 750 K of software or files. The most common disks currently are 3 1/2 inches in diameter and are stored in a rigid plastic case. The amount of software or files that can be stored on a disk is still limited–2 MB is the maximum storage on most disks. In order to access the information stored on a diskette, the diskette must be placed in the computer's disk drive (sometimes called a floppy disk drive).

EGA (enhanced graphics adapter) - EGA was the successor to the original CGA video standard on IBM and IBM-compatible computers. EGA adapters can display text or graphics in 16 colors on monitors compatible with EGA. EGA adapters are also capable of displaying smaller type (24 lines on any screen), which allowed reading software to include much larger passages of text on any screen.

File Server - File servers are microcomputers that are typically not available for student use. Teachers and administrators use this computer to view student records and to install or delete software programs. The file server's hard drive usually holds all the instructional software. Students can access this software on any of the microcomputers linked through a network. The file server may also have a CD-ROM drive attached so that it can offer a wider range of software options.

Hand Held Device - Hand held devices are small microcomputers that can be held in your hand. The most common uses include electronic dictionaries, calculators, language translators, and image scanners.

Hard Drive - A device which stores large amounts of computer information on a semipermanent basis. Instructional and administrative programs are usually installed on a hard drive so that they can be easily and rapidly used. Data stored on a hard disk may be read into the computer for use, manipulation, or change; data may also be deleted. Unlike RAM memory, however, information stored on a hard drive is not lost if the computer's power supply is interrupted or terminated.

Interactive Videodisc - Interactive videodisc (IVD) programs use a laser disc the size of a record album to store as many as 60 minutes of full motion video and several hours of high quality audio. Laser discs are very similar to CD-ROMs, the only differences being the size of the disc and the amount of information a single disc can store (a gigabyte or more). With the proper software and wiring, a computer can control a video disc player. This allows software developers to incorporate photographs, digital video, and digital audio into their instructional programs in larger quantities. Students using IVD programs have the opportunity to see standard computer text and graphics, full motion video, video still frames, and any combination of these types of visuals while listening to information played over the audio track. There are several types of videodiscs categorized by how they are used. The most common are known as Level 1 and Level 3. A Level 1 videodisc delivers video in a linear fashion, similar to a videotape. A Level 3 videodisc is designed to operate only as part of an interactive computer-based system. Typically, a Level 3 videodisc provides the user with control of the program. An input device such as a touch screen, light pen, mouse, or keyboard is used. The combination of computer software and full motion video delivered on the same screen became an option for adult literacy programs in the mid-1980s when interactive videodisc programs like IBM's PALS (Principals of Alphabet Literacy System) were released.

Integrated Learning System - An integrated learning system (ILS) is a complete software, hardware, and network system for literacy instruction. An ILS usually includes a number of tools and lessons such as a student assessment tool, curriculum and lesson levels that progress with the student, and a student record keeping/report writing tool that records student progress and biographical information and produces individual and group reports. The most common ILSs are CCC (Computer Curriculum Corporation), CCP (Comprehensive Competencies Program), ClassWorks, PLATO, and WICAT.

Internet - The Internet is the largest computer network in the world. Computers on the Internet have two things in common. First, all of the computers are connected to one another on a round-the-clock basis. Second, all of the computers use a common "language," the Transmission Control Protocol/Internet Protocol (TCP/IP), to communicate with one another. Services like America Online, Delphi Internet Services, and others provide their members with access to some or all of the information resources on the Internet, but the user's computer is not on the Internet per se because it does not remain connected twenty four hours-a-day. The Internet provides software and document retrieval, electronic mail, bulletin boards and other services to users.

K - Kilobytes (see **Byte**).

Keyboard - An input device that allows users to provide the computer with new information or directions for operation through a typewriter-like series of keys. Almost all computers have keyboards attached. Students use the alpha-numeric keys to type in letters, words, sentences, or numbers. Keyboards usually have a set of arrow keys that allow the user to move the cursor around on the screen. Many basic skills programs use the arrow keys to allow students to "point" to a correct answer from among many possible choices on the screen.

Light Pen - A light pen is an input device. Light pens typically have a cable that attaches them to the computer. The user touches the screen with the light pen to indicate a response.

Local Area Network (LAN) - Two or more microcomputers linked together via a system of cables and specialized software. LANs are usually confined to one building. All the computers linked in a LAN can access the same library of software. Networks are often used to keep student records on a central computer called a file server. Networks can also be used to share other computing resources like laser printers and modems.

MB - Megabyte (see **Byte**).

Microcomputer - A type of computer that superseded the large mainframes developed during the 1960s and 1970s. Microcomputers use microprocessors to control the computer's actions and to perform all computation rather than vacuum tubes. The typical system uses a monochrome monitor, floppy disks for storage, and a keyboard for input. Newer systems use color monitors, hard drives, and CD-ROMs.

Modem - A piece of equipment that connects a computer to a data transmission line (typically a telephone line of some sort). Modems allow two computers to exchange data with one another. Modems come in different data transmission speeds. Most modems can transfer at least 2,400 bits per second (bps); the most commonly used modems can transfer 9,600 bits per second or 14,400 bits per second.

Monitor - A device that is connected to a computer and used to display text and graphics. Monitors are similar to regular TV sets, but use a digital signal rather than an analog signal like the TV. For this reason, most TVs cannot be used with the computer, and most computer monitors cannot be used to display regular TV images.

Mouse - The mouse is a much more sophisticated and flexible pointing device than the arrow keys on the keyboard. It allows students to move the cursor to any point on the screen very quickly and only takes about ten minutes of practice to master. Basic skills software programs using the mouse typically offer students a greater number of chances to interact with the program than those using the keyboard alone.

Network - Two or more computers connected electronically so that people using them can share files and devices (such as printers and modems) and exchange electronic mail. Special types of networks include local area networks (LAN) and wide area networks (WAN).

Printer - An output device used to create text and graphic images on paper. Printers come in three types. Laser printers produce the highest quality output and highest printing speed, but are generally more expensive than ink jets and dot matrix printers. Ink jet printers use a stream of tiny ink dots to create images on paper. Because the ink does not dry immediately, the image tends to smudge and blur. However, ink jet printers are substantially cheaper and can produce high quality output if used carefully. Dot matrix printers create images by tapping tiny pins against a ribbon as the cartridge moves across the page. Dot matrix printers are slower and produce output generally considered unsuitable for professional purposes. Dot matrix printers are usually cheaper than ink jet printers.

RAM (random access memory) - RAM is the memory the computer uses to temporarily store information that the microprocessor needs to operate a computer program. Information stored in RAM is lost the moment power is interrupted to the computer. The amount of RAM determines the size of programs that can be executed by the computer.

ROM (read only memory) - ROM stores special instructions that the computer needs in order to run properly. As the name implies, information stored in ROM is never changed, only read as needed.

Scanner - A device that converts a printed page into an electronic representation that can be viewed and manipulated on the computer. Scanners are often used to convert photographs into electronic representations so that they can be included in documents created on the computer.

Super VGA Monitor - All newer monitors offer the option of 256 colors on the screen. This is a quantum leap over the 16 color EGA and VGA palettes and allows much more sophisticated and interesting graphics. Super VGA, also called SVGA, creates the opportunity for software developers to use digitized color photographs and even full motion video.

Synthesized Audio - Synthesized audio is the robotic sounding audio used in a variety of instructional software to simulate human speech. The quality of this type of audio has improved since it was introduced in the early 1980s. It is used mainly as a way for students to hear a pronunciation of text presented on the screen or for the computer to "read" what they have typed back to them.

Telecourses - An interactive telecourse provides an opportunity for one teacher to reach students in many locations at once. Typically the instructor teaches to a regular class in a classroom equipped with television cameras and microphones. The teacher's image and voice is then sent through microwave transmission, cable TV, or other sophisticated "narrowcasting" format to remote classrooms or homes. Remote classrooms may be equipped with television cameras and microphones so the instructor can see and hear the students attending class in that remote location. Students at home watching a telecourse on cable TV might have the opportunity to call the instructor during class to ask a questions or participate in a discussion using an 800 telephone number.

Touch Screen - The touch screen allows the user to input information by actually touching the screen of the computer's monitor. Sometimes an electronic device called a light pen is used to touch the screen, but often the student just uses his finger or the eraser on a pencil. Like the mouse, the touch screen allows a great deal of flexibility in terms of input options. Two disadvantages compared to the mouse are:

- reaching up to touch the screen repeatedly can be very tiring
- there is a perceived loss of privacy by students since anyone in the room might be able to see the student's response as he touches the screen.

VCR and Videotape Programming - Many adult education programs are delivered over videotape. Students can view these programs individually or as a group. The most extensive collection of ABE and GED video programs has been produced by Kentucky Educational Television (KET).

VGA (video graphics adapter) - VGA superseded EGA. VGA can support 16 colors on most monitors; in some cases VGA video adapters can support 256 colors. VGA was superseded by SVGA.

Video Adapter - A computer board that plugs into a slot on the computer's main circuit board and allows the computer to display text and graphics on a monitor.

Virus - A destructive type of computer program that attempts to interfere with the normal operation of the computer, re-write or delete information from hard drives or floppy disks, and, in some cases, cause physical damage to the computer. Viruses are usually developed by programmers to demonstrate their technical expertise and often are not intended to cause the harm done. Viruses can be spread from computer to computer over networks and by sharing floppy disks. Several free and commercial software packages are available which can detect and remove viruses already on a computer; these packages can also prevent infection by continuously monitoring the computer for signs of infection.

Wide Area Networks (i.e., Internet, America Online, etc.) - A network that spans many geographically separated locations. A WAN links local networks or individual users through a special type of telephone line provided by a telecommunications service, such as a leased line or fiber optic cable.

Computer Technology and Adult Literacy: An Implementation Guide

Introduction

The extent and sophistication of computer technology available to adult literacy programs have increased dramatically in recent years. Technology implementation efforts could be improved if a more systematic approach were used for implementation. Unfortunately, many literacy providers do not have the time or the knowledge for making such informed decisions.

This brief document offers program staff a suggested approach for planning and implementing computer assisted instruction (CAI). It is designed as a basic primer, with seven steps to follow when integrating computers into instructional programs.

The Steps

- Develop a vision for the future
- Identify planning resources
- Determine the instructional needs of the learners
- Explore and evaluate potential software applications
- Determine hardware configuration
- Acquire software and hardware
- Conduct staff development activities

Develop a Vision

Implementation of computers within literacy programs can be a confusing process. What type of software will best meet the needs of the learners? What type of hardware should be selected? What about other peripherals such as printers, modems, or CD-ROM drives?

At first, the vision of how computers might be used may be fragmented. And usually these fragments are based on the ways we now use technology in our personal and professional lives. The ultimate look of how computers will be applied is a function of program people and their desire to create new instructional solutions. As such, it is important, even at the very beginning stages of forming the vision, that those who will ultimately use the technology be actively involved in the planning process.

Identify Resources

While people are critical to the success of the planning effort, their effectiveness is determined in part by the quantity and quality of resources they have available to them. The most important resources include:

- Access to information.
  - Current research on the use of computers in literacy programs
  - Information on other literacy programs using computer technology
  - Appropriate journals that illustrate effective practices
  - Availability of special publications that focus on evaluation of technology
- Staff experience
  - Skill levels and technological awareness of current staff members
- Consultants
  - Acquisition of specialized skills and knowledge not available through other information sources

Determine Instructional Needs

The computer technology that is ultimately implemented must meet the instructional needs of the learners. To meet these needs it is important to know the skill level of the learners.

One valuable tool for identification of skill level is standardized testing. This type of instrument provides grade-level approximations and therefore can be helpful in identifying appropriate software. Perhaps even more valuable are criterion-referenced instruments that identify specific competencies. Rather than identifying grade levels, criterion-referenced tests provide information that can be useful in selecting software that correlates to specific instructional content currently in use.

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Evaluate Software Applications

Instructional computing applications can be categorized by instructional mode, or the relationship between the learning and the technology being used. In the area of computer software, applications can usually be broken down into five fundamental categories:

- Drill and practice - repetitive type problems that reinforce previously taught materials
- Tutorials - programs that teach new skills in an interactive manner
- Simulations - interactive type learning environment where students are placed into a situation and challenged to seek solutions
- Problem solving - application of knowledge and skill to achieve a relevant outcome or goal
- Productivity - word processing, data bases, spreadsheets, graphics, etc.

Software selection must precede hardware acquisition. It is very important to understand that computer hardware does not provide instructional value; skills and knowledge are gained through effective software that addresses the needs of learners.

When identifying software appropriate for use with stand-alone computers, the first step is to develop a list of objectives. The same holds true for exploring the potential adoption of an integrated learning system. Here again, it is not the hardware that should drive the decision-making process. Rather, it is the software and the specific instructional objectives that are to be addressed that must form the basis for selection.

So where do you find out about software programs that are appropriate for classroom use? Information sources include:

- Software reviews in education magazines
- Vendor demonstrations
- Educational conferences
- Colleagues that are now using software in classroom settings
- Education computer user groups

Organizations or projects formed specifically to assist educators in the selection of appropriate software programs are particularly good sources for formal evaluations of the different programs available. Most of these projects offer summaries of software that is appropriate for adult literacy students.

There are many evaluation forms that can be used as guides to evaluate computer software. Typically, most of these forms group evaluative criteria into three categories: content, instructional design, and technical design.

It is very unlikely that any individual piece of software or any integrated learning system will meet all of the instructional needs of any group of students. You will have to make judgments on whether the inadequacies of a software package can be overcome through other means.

Determine Hardware Configuration

Before purchasing hardware you need to determine the specific computer capabilities required for each selected application. For most applications there may only be one or two choices which will support the software you select. To define your hardware needs, start by answering the following questions for each application:

- What software is required? Actually list the programs. For these software applications, what are the requirements for RAM memory, number of disk drives or hard disk space required, type of monitor, printer requirements, special features?
- Who is going to use the system(s)?
- How many learners will use the system?
- How much time do learners need to accomplish the intended objectives?
- Where and when will the computers be available?
- What are the concerns for security?

Depending on the software you ultimately choose to implement and the software required, your hardware options will fall into one or a combination of the following configurations:

- Stand-alone microcomputer
- Networked microcomputers

- Integrated learning system (networked)

Each of the configurations has inherent advantages and disadvantages that you should consider before making a final choice.

Advantages	Disadvantages
Stand-alone Micros	
• low cost	• multiple copies of software needed
• portability	• cumbersome for record keeping
• flexible configuration	
Networked Micros	
• easy access to central library	• technical expertise required
• ease of student use	• not all software is available
• record keeping	
• peripheral sharing	
Integrated Learning Systems	
• extensive software	• locked into a system
• excellent reporting	• usually an annual license fee

Acquire Hardware and Software

Hardware selection involves complex decision making which is complicated by new developments in this rapidly changing technology. When you have fine-tuned the final hardware configuration for each application, you should be able to estimate hardware costs. Projecting other related costs may be more difficult. The following estimates may be helpful for budget planning:

Item	% of Budget
Software	20%
Hardware	70%
Maintenance	5%
Miscellaneous Supplies	5%

Staff Development

Before you make a commitment to undertake a significant program initiative, you should consider the real costs of implementation in terms of time, money, and organizational impact. In deciding which computer applications you can implement, the training needs of the instructional staff are a major factor. However, having selected software and hardware, you should find it to be relatively easy to estimate staff development requirements.

Remember that it is important to distinguish between staff awareness activities conducted as part of the preliminary planning activities and actual staff development. At this level of implementation you should focus on preparing staff to deliver instruction, utilizing specific hardware and software. The following are some basic guidelines for building an effective staff development program:

- Training activities should be in a sequence that gradually increases in complexity.
- Training should be sufficiently flexible to allow trainees to begin at their own level of ability and to progress at their own rate.
- Training should take place during the work day and make use of actual situations involving students.
- Incentives should be provided which motivate the staff to actively participate.
- Whenever possible, staff members within the organization should be used as instructors in the training.
- Instructors should have an opportunity to practice new skills in the course of their regular teaching.

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Adult Literacy Software Evaluation Criteria

This guide is designed to be used by adult literacy instructors, administrators, and tutors for evaluating the appropriateness and effectiveness of specific software products. Each section features a different aspect of using software with the adult learner. The questions are designed to help the practitioner consider a variety of relevant issues in order to evaluate and make decisions about the best possible software to use in particular situations.

I. Learner/Computer Interaction
1. Exercises are appropriate?
2. Exercise frequency is adequate?
3. Directions and instructions are clear?
4. Type and place of requested response is clear?
5. Feedback after response is helpful?
6. Final evaluation of learner's performance is provided?
7. Software is easy to operate?

II. Learner Control
1. Options, menus, and choices are available?
2. Display time is under learner's control?
3. Mouse exercise directions are adequate?
4. Movement within software is easy?
5. Obvious exits are available at all times?

III. Sequencing of Instructional Events
1. Goals and objectives are specified explicitly?
2. Instruction is organized from general to specific?
3. Adequate exercises and examples are provided to explain concepts?
4. Major concepts are easily identified through visual cues?
5. Different opportunities are provided for different ability levels?

IV. Screen Design
1. Screen layout is pleasing?
2. Instructions are provided in areas separate from text?
3. Color is used effectively?
4. Exercises with the mouse require dexterity appropriate to students' ability?

V. Readability
1. Screens contain an amount of text appropriate to students' reading ability?
2. Content is relevant to adults?
3. Reading level is appropriate to learners' reading level?
4. Software teaches important reading comprehension skills?

VI. Administration
1. Accessing the course on the computer is easy?
2. Procedures for enrolling new students is clear and easy?
3. Student progress is easily tracked?

VII. Questions to Ask Students
1. Do you think this program helped improve your skills?
2. What did you like most about using this program?
3. What did you like least about this program?
4. How do you feel about using a computer for learning new skills?
5. Would you recommend using this program to a friend?
6. Are there any suggestions you have about how we could make this program better?

Internet-based Videoconference Resources: What is Available and How to Find Them

In order to facilitate continued dialogue between videoconference participants and to assist practitioners in the discovery of resources on the Internet, the National Center on Adult Literacy (NCAL), in cooperation with the Outreach and Technical Assistance Network (OTAN) and PBS ONLINE, has created several information resources and communications forums on the Internet.

This document is divided into three parts.. Part I lists the Internet resources created for the videoconference and those additional resources available on-line that are relevant to the field of adult literacy. Part II provides specific instructions for subscribing to and accessing some or all of these resources through America Online and Delphi Internet Services, the largest commercial on-line services which currently offer modem access to the Internet. Part II also includes information about connecting with the Outreach and Technical Assistance Network, a bulletin board developed specifically for adult literacy practitioners in California. Part III concludes with general instructions for accessing the videoconference resources if you already have access to the Internet through an institutional affiliation like a university, community college, or public library.

Part I: Videoconference Resources On-line

There are three videoconference-related resources available on-line:

Internet E-mail List

NCAL, in partnership with OTAN, has created an e-mail-based mailing list on technology issues (such lists are sometimes generically called LISTSERVs). Once every two weeks or so, list participants will receive an e-mail "newsletter" from the NCAL/OTAN staff on breaking news and emerging issues in adult literacy technology.

To become a member of the e-mail list on technology, send an e-mail message to listserv@listserv.hlpusd.k12.ca.us with the words "subscribe OTAN-L Your Name" in the body, replacing Your Name with your first and last name. Do not include the quotation marks in your subscription message, but be sure to include the spaces as shown above. If you have trouble using the system, send a message with the word "help" in the body to listserv@listserv.hlpusd.k12.ca.us; the system will send back an e-mail message with a list of commands and an explanation of their use. Again, do not include the quotation marks in the message.

Participants will be able to hold interactive discussions on issues raised in the newsletter by sending e-mail messages to the address otan-l@listserv.hlpusd.k12.ca.us. These messages are "reflected" back to all of the list participants. Participants may then comment upon both the original newsletter and their fellow participants' messages by sending messages to otan-l@listserv.hlpusd.k12.ca.us.

USENET Discussion Group on Adult Education and Adult Literacy

In March 1994 NCAL helped establish a new USENET discussion group on adult education and adult literacy entitled "MISC.EDUCATION.ADULT." The USENET system (sometimes called the "NetNews" or "Network News" system) is a giant, world-wide bulletin board where people interested in a topic can converse using e-mail-like messages. Because USENET is so large, the bulletin board is divided into separate discussion spaces using a hierarchy of names. There are seven major discussion areas, each represented in the actual USENET list by a three or four letter abbreviation: Recreation (rec), Computers and Networking (comp), the USENET system (news), Science (sci), Social (soc), Discussion (talk), Miscellaneous (misc), and Alternative Views (alt). Each major discussion area is further divided into subdiscussions. Thus the Miscellaneous major discussion group has a set of subdiscussions on education issues. The group on adult education and adult literacy is one of those.

Like a mailing list, the discussion consists of electronic messages. A person who wants to discuss an issue posts a USENET message to a group which is relevant to the issue. For instance, a discussion of retention issues in adult literacy or adult education would be held in MISC.EDUCATION.ADULT, while a discussion of Star Trek would be held in REC.ARTS.STAR.TREK. The title of a group usually suggests the appropriate content; in addition, most services have a directory of USENET groups and their topics on-line. Unlike e-mail lists, however, USENET messages do not appear in your e-mail box. Instead, USENET messages are stored on a large computer called a server. To participate in a USENET discussion, you must log into a USENET server, select the discussion group, and then select the messages listed in that group which interest you. To respond, use the USENET software provided on your system to post a new message.

NCAL plans to hold a series of discussions about the videoconference in MISC.EDUCATION.ADULT. It is hoped that the USENET group will be a place where practitioners who participated in the videoconference will be able to electronically meet one another, exchange ideas and information, and build human contacts using electronic means.

NCAL's Internet Gopher

NCAL established an Internet Gopher server in April 1993. The Internet Gopher is software that allows the user to recover information stored on computers that are connected to the Internet. Gopher uses a series of menus to help users find information resources and then transfer those information resources, whether they are software or electronic documents, to their computers.

NCAL uses its Gopher to electronically distribute its research publications, newsletters, calendar of events, and information about related programs in the University of Pennsylvania's Literacy Research Center. In addition to electronic publications, NCAL's server also offers two other services. Through its Gopher, NCAL has made available its searchable database of information about adult literacy software and companies that publish adult literacy software. NCAL's Gopher can also lead you to other Gopher servers that have adult literacy resources, including archives of free or low-cost software, electronic journals related to adult literacy, databases from the Educational Resource and Information Center (ERIC) system, and the OTAN adult literacy archives. For the videoconference, NCAL has created a new area within its Gopher containing materials developed for the videoconference, including electronic copies of the participant packets.

If you are using America Online or Delphi Internet Services to access the Internet, read Part II of this document for more directions on finding the videoconference resources. If you are using an institutional access point, read Part III of this document for general hints on finding these resources. If you do not currently have access to the Internet, you may gain access by subscribing to America Online (AOL), Delphi, or any of the services listed in the document "Joining the On-line Community, Part III." See Part II of this document for details on subscribing to AOL and Delphi. Part II also provides information on subscribing to the OTAN Online Communication System, which carries a subset of the Internet resources listed above.

Part II: Using America Online, Delphi Internet Services, or OTAN to Find Videoconference Resources

There are several services which carry the online resources developed for this videoconference. Two commerical online services, America Online and Delphi Internet Services, now offer access to the Internet and thus the resources developed for the teleconference. In addition the Outreach and Technical Assistance Network (OTAN), in cooperation with Connect, Inc., is also providing access to the e-mail LISTSERV mentioned above through their system. OTAN offers other information resource and communication forums for adult literacy practitioners, primarily in California but in other states as well. Outside of California, America Online (AOL) is the recommended access provider because it offers 10 free hours of service to new users, has an easy to install and easy to use interface, and has several proprietary information resources and communication groups devoted to adult literacy. However, AOL's Internet features are still incomplete and somewhat error-prone. Delphi Internet Services offers a full range of Internet services, but the user interface is text-only and the introductory offer includes only 5 free hours of use.

The sponsors of this videoconference neither support nor endorse the use of any of the on-line services mentioned in this document; any recommendations are for informational purposes only.

For additional information on accessing on-line services and resources, see "Joining the On-line Community, Parts I-III" in the reference materials section of this guide.

America Online
Phone: 1-800-827-6364

Subscribing:

If you are not already a member of America Online, do the following:

1. If you or your program has more than one computer, decide which computer will be used to dial into America Online.
2. If you do not have one, order a modem and cable. Preferably, the modem should operate at 9,600 or 14,400 bps. However, the modem MUST be compatible with the Hayes AT command set (the modem package should say something to the effect of "Hayes Compatible" or "100% Hayes Compatible;" if you have questions, consult with the store where you plan to buy the modem). If any of these terms are unfamiliar to you, consult the "Glossary of Technology" that came with this packet.
3. If you have an IBM, find out how much random access memory (RAM) your computer has, how large the hard drive is, what type of video adapter it uses, the version of DOS you use, and (if applicable) the version of Windows used.
   If you have a Macintosh, determine how much RAM memory you have, how large your hard drive is, and the version of the system software you use.
4. Call America Online at 1-800-827-6364. Provide the sales representative with the information about your computer that you collected earlier and ask them whether America Online's software will work with your

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system. If not, ask them what you would have to add to your computer in order to make it work properly. America Online will ship you the software necessary to subscribe to America Online in 10-14 days. If you need help with any aspect of using America Online, call the same number (1-800-827-6364).

IMPORTANT: When you subscribe to America Online, the system will request your credit card number. America Online provides you 10 hours of free service during the first thirty days you are subscribed to the system. When the initial ten hours are used or after thirty days, subsequent connections to America Online will be charged to your credit card. We encourage you to monitor your on-line time carefully if you intend only to take advantage of the free time and do not intend to continue your subscription. The sponsors of this videoconference have not purchased connection time from America Online and are not responsible for usage charges arising from participation in any of the on-line follow-up activities.

Using America Online's Internet Features:

Below is a guide to finding and using America Online's (AOL) Internet features. This is not a comprehensive guide; you should first become familiar with AOL's Internet features before attempting to use these instructions.

America Online's Internet Center is still under construction; as a result, parts of this guide may be inaccurate due to "new construction." If you get lost, call the phone number listed above.

E-mail:

1. Log in.
2. Select the "Mail Gateway" command in the "Mail" menu.

To compose and send a message:

1. Click on the "Compose Mail" icon. An e-mail form will appear.
2. Enter the e-mail addresses of the recipients of the message in the "To" and "CC" fields. The addresses will either be the screen names of other AOL members or an Internet type address like joe@computer.anywhere.company.com.
3. Enter the subject and body of the message.
4. Click on the "Send Now" icon.

To read a new or previously received message:

1. Select the "Read New Mail" command from the "Mail" menu.
2. Click on the "Read" button.

USENET Bulletin Board System:

1. Log in.
2. Select the "Keyword" command in the "Go To" menu.
3. Enter "internet" in the "Enter keyword" field.
4. Click on the "Newsgroups" icon.
5. Click on the "Enter USENET Newsgroups" icon.

To read the default newsgroups:

1. Click on the "Read My Newsgroups" icon.
2. Scroll down the list of newsgroups.
3. Choose the group you wish to read and click "List Unread."
4. Choose a message you wish to read and click "Read Message."

To reply to a message you have read:

1. Click on the "Send New Message" icon.
2. Enter a subject and text.
3. Click on send.

To add a new group (like MISC.EDUCATION.ADULT) to your list of newsgroups:

1. Click on the "Add Newsgroups" icon.
2. Select the major topic area you wish to explore and then click on "List Topics" (if you want to add MISC.EDUCATION.ADULT, you will need to click on "Miscellaneous" here).
3. Select the sub-topic you wish to explore and click on "List Newsgroups" (for MISC.EDUCATION.ADULT, click on "Education" here).

4. Select the newsgroups you wish to add and click on "Add." If you wish to explore the group before adding it to your list, you may list the topics or read messages using the appropriate buttons.

Internet Gopher:

1. Log in.
2. Select the "Keyword" command in the "Go To" menu.
3. Enter "internet" in the "Enter keyword" field.
4. Click on the "Gopher & WAIS Databases" icon.

NOTE: Because America Online's Internet Gopher software was still under development at the time this was written, more explicit directions could not be provided. The National Center on Adult Literacy's Gopher will be listed in the "Editor's Choice" area of AOL's software. Select this option and look for a server named "National Center on Adult Literacy/Litnet."

Delphi Internet Services, Inc.
Phone: 1-800-695-4005

Subscribing:

If you are not already a member of Delphi Internet Services, do the following:

1. If you or your program has more than one computer, decide which computer will be used to dial into Delphi.
2. If you do not have one, order a modem and cable. Preferably, the modem should operate at 9,600 or 14,400 bps. However, the modem MUST be compatible with the Hayes AT command set (the modem package should say something to the effect of "Hayes Compatible" or "100% Hayes Compatible;" if you have questions, consult with the store where you plan to buy the modem). If any of these terms are unfamiliar to you, consult the "Glossary of Technology" that came with this packet.
3. If your modem did not come with terminal emulation software (software which controls the modem and allows you to communicate with Delphi), you will need to purchase it from a software vendor. The most popular packages for IBM compatibles is ProComm 2.4 from DataStorm and SmartCom from Hayes Microsystems. On the Macintosh, the most popular packages are MicroPhone Pro from Software Ventures and SmartCom II from Hayes Microsystems. You will need to become familiar with the software before attempting to connect with Delphi. Specifically, become familiar with the stop bit, data bits, and parity settings in the software. The software's manual should help you sort out these settings.
4. Call Delphi at 1-800-695-4005. The sales representative will give you a user name and password which will allow you to log into the system. Also ask the sales representative to give you the parity, data bits and stop bit settings for your modem software.

IMPORTANT: When you subscribe to Delphi Internet Services, the system will request your credit card number. Delphi provides 5 hours of free service during the month in which you subscribe. When the initial five hours are used or at the end of the month in which you initiated your subscription, subsequent connections to Delphi will be charged to your credit card. Additionally, Delphi imposes a $9 surcharge for using the service during business hours. We encourage you to monitor your on-line time carefully if you intend only to take advantage of the free time and do not intend to continue your subscription. The sponsors of this videoconference have not purchased connection time from Delphi Internet Services and are not responsible for usage charges arising from participation in any of the on-line follow-up activities.

Using Delphi's Internet Features:

To use any of Internet services, you must first register as an Internet user. Delphi charges an additional $3 per month for access to Internet tools. To register as an Internet user:

1. Log in.
2. Enter "Terms" and hit return. This will take you through the terms of use for Delphi's Internet service. Be sure to read this document before continuing.
3. Enter "Register" and hit return.
4. Enter "Exit" and hit return. This will leave you in Delphi's Internet special interest group (SIG). Entering "Exit" and hitting return a second time will return you to the main menu.

E-mail:

To compose and send a message:

1. Log in.
2. Enter "mail" and hit return.
3. Enter "mail" (again) and hit return.
4. Enter "send" and hit return.
5. Next to "To" enter the e-mail address of the person you want to receive the message.
   a. If the recipient is a Delphi member, just enter the person's Delphi user name.
   b. If the recipient has an account on any other system, use this form:

      If the address is Joe.Dimaggio@damned.yankees.ny.com, enter the following next to "To:"

      IN%"Joe.Dimaggio@damned.yankees.ny.com"

6. Enter a subject and hit return
7. Enter the text of the message. When you are finished entering the text, hit the "Control" (sometimes abbreviated "ctrl") and "Z" keys simultaneously to send the message.

To read a new or previously received message:

1. Log in.
2. Enter "mail" and hit return.
3. Enter "mail" (again) and hit return.
4. Enter "read" and hit return. This will display the most recently received message. By hitting additional returns, previous messages will be displayed.
5. To stop reading, hit "Control" and "C" simultaneously.

USENET Bulletin Board:

1. Log in.
2. Enter "Internet" and hit return TWICE.
3. Enter "usenet" and hit return.
4. Enter "usenet" (again) and hit return.

To read the MISC.EDUCATION.ADULT group and save it to your list of "personal favorites":

1. Enter "2" and hit return.
2. Enter "misc.education.adult" and hit return.
3. Enter "all" and hit return. This will allow you to read all of the messages archived in the last week or two.
4. Enter "save" and hit return. When asked to confirm that you want this group added to your personal list, enter "y" and hit return.
5. To continue reading, choose a subject, enter its number and hit return.
6. To discontinue reading at any time, hit "Control" and "C" at the same time. Entering "back" will take you back to the Usenet reader menu.

Once you have added MISC.EDUCATION.ADULT to your "favorites" list, you can read postings by doing the following:

1. Enter "1" and hit return.
2. Find the group's number, enter it and hit return.
3. Enter "unread" and hit return to read all new messages since you last logged in.

Internet Gopher:

1. Log in.
2. Enter "Internet" and hit return TWICE.
3. Enter "gopher" and hit return.

To find the National Center on Adult Literacy Gopher:

1. Enter the number corresponding to the "Social Sciences, History, and Education" menu entry and hit return.
2. Enter the number corresponding to the "Education" menu and hit return.
3. Enter the number corresponding to the "National Center on Adult Literacy" menu item and hit return.

The same process of entering the number of the desired information and hitting return will enable you to retrieve information from the NCAL server.

Outreach and Technical Assistance Network (OTAN)
Phone: 1-800-894-3113 (CA only)
1-916-228-2580

Subscribing:

1. If you or your program has more than one computer, decide which computer will be used to dial into OTAN.
2. If you do not have one, order a modem and cable. Preferably, the modem should operate at 9,600 bps. However, the modem MUST be compatible with the Hayes AT command set (the modem package should say something to the effect of "Hayes Compatible" or "100% Hayes Compatible;" if you have questions, consult with the store where you plan to buy the modem). If any of these terms are unfamiliar to you, consult the "Glossary of Technology Terms" that came with this packet.
3. If you have an IBM, find out how much RAM memory your computer has, how large the hard drive is, what type of video adapter it uses, the version of DOS you use and the version of Windows (if applicable). If you have a Macintosh, determine how much RAM memory you have, how large your hard drive is, and the version of the system software you are using.
4. Call OTAN at 1-800-894-3113 (CA only) or 916-228-2580. Provide the representative with the information about your computer that you collected earlier and ask them whether OTAN's software will work with your system. The OTAN software is $99.00. On-line charges for administrators are $14.00 per month, which includes the first hour; additional hours are billed at $12.00 per hour. Classroom teachers are eligible for special pricing: $12.00 per hour with a monthly minimum charge of $2.00. The system supports Macintosh, Windows, and MS DOS users.

IMPORTANT: The sponsors of this videoconference have not purchased connection time from OTAN and are not responsible for usage charges arising from participation in any of the on-line follow-up activities.

See the user's guide and materials for information on using OTAN's e-mail service to subscribe to the technology LISTSERV mentioned in Part I of this document.

Part III: Using Institutional Internet Access Points to Find Internet-based Videoconference Resources

This section is intended for those individuals who already have access to the Internet through an institutional network –most likely in a university or community college setting. If you do not have access to the Internet yet, consult Part II of this document or Part III of the document "Joining the On-line Community."

Because of the enormous variety of Internet software tools used for e-mail, the USENET bulletin board system, and Gopher, these directions can only be general in nature. For more information, consult your network specialist or laboratory assistant. In addition, there are several excellent references available about the Internet and different tools for UNIX, Macintosh, DOS, and Windows. Consult the reference list for more details.

USENET Bulletin Board System:

On most UNIX systems, the USENET bulletin board system is accessed using the "nn" or "rn" software packages. Videoconference-related discussions will be held in the MISC.EDUCATION.ADULT newsgroup. In the nn reader, you can edit the .newsrc file to subscribe to the group using a text editor like vi, ed or emacs. To subscribe to MISC.-EDUCATION.ADULT, change the exclamation point at the end of MISC.EDUCATION.ADULT entry in the .newsrc to a colon. **WARNING:** do not attempt to reconfigure your newsreader unless you are familiar with nn and its operation.

On the Macintosh, there are several popular (and free) newsreaders, including NewsWatcher and InterNews. On the PC, the most popular freeware newsreader is Trumpet, which will run on DOS and some Windows machines. Check your software's documentation for more details about subscribing to and participating in newsgroups like MISC.EDUCATION.ADULT.

Internet Gopher:

Find the number and related instructions which best describes your system and your knowledge of that system.

1. **If you already have Gopher installed on your hard drive or know how to use a telnetable Gopher client:**
   NCAL's server may be found on the "Home Gopher Server" in the folder/directory "Other Gopher and Information Servers/All Gopher Servers in the World" under the name "National Center on Adult Literacy/Litnet." Or you may point your Gopher client at "litserver.literacy.upenn.edu."

2. **If your computer is already configured to use Internet communications software (i.e., telnet, ftp, netnews, etc.) and you know how to use FTP:**
Gopher clients (i.e., software used to communicate with computers using Gopher) may be obtained free of charge via FTP (file transfer protocol) from the University of Minnesota. FTP to "boombox.micro.umn.edu"; the Gopher clients are stored in the "pub/gopher" folder/directory. Currently, clients are available for the following operating systems: Macintosh (TurboGopher is the best Mac version), Windows, DOS (several versions of varying quality), OS/2, NeXT, Unix, and VMS. Installation instructions are included with the client software; make sure to download any "readme" files as well.

   Once you have installed and started up your Gopher client, NCAL's server may be found on the "Home Gopher Server" in the folder/directory "Other Gopher and Information Servers/All Gopher Servers in the World" under the name "National Center on Adult Literacy."

   IMPORTANT: To work properly, your computer or LAN must be connected directly to the Internet or have access to a Serial Line Internet Protocol (SLIP) or Point-to-Point Protocol (PPP) modem service. Additionally, you must have the proper packet drivers (software which facilitates communication via the Internet). If you are not sure your computer is properly configured for Internet communications, consult your network or computer lab administrator before attempting to install or use Gopher.

3. **If you know how to start a telnet session, either from a machine directly connected to the Internet or by using a modem:**
There are several telnetable Gopher clients (i.e., clients which may be accessed using a terminal emulation program; some terminal emulators are designed for computers that are directly connected to the Internet, others may be used with a modem):

Hostname	IP#	Login	Area
consultant.micro.umn.edu	34.84.132.4	gopher	North America
ux1.cso.uiuc.edu	128.174.5.59	gopher	North America
panda.uiowa.edu	128.255.40.201	panda	North America
gopher.msu.edu	35.8.2.61	gopher	North America
gopher.ebone.net	192.36.125.2	gopher	Europe
info.anu.edu.au	150.203.84.20	info	Australia
tolten.puc.cl	146.155.1.16	gopher	South America
ecnet.ec	157.100.45.2	gopher	Ecuador
gan.ncc.go.jp	160.190.10.1	gopher	Japan

   Telnet clients may not allow you to download fully formatted documents. However, the telnet client can send any plain text document to your e-mail account. If you choose to e-mail yourself any of NCAL's longer documents, be sure to choose the text version.

   NCAL's server may be found on the "Home Gopher Server" in the folder/directory "Other Gopher and Information Servers/All Gopher Servers in the World" under the name "National Center on Adult Literacy."

   IMPORTANT: You may have access to telnet and not realize it. Many e-mail accounts are accessed using telnet. If, to access your e-mail account, you must enter a long, period-separated hostname like those listed above, you may have access to telnet. Check with your network administrator for more details.

4. **If you are not using any of these services currently:**
If you have a local area network or computer laboratory in your place of work, public library, or literacy program, check with the network or laboratory administrator to see if you can gain access to the Internet from their facility. You may have Internet services but not realize that you do.

   Even if you have no affiliations with Internet-capable institutions, you may still be able to access the Internet. Any personal computer equipped with a modem (a device which allows computers to exchange information with one another via plain phone lines) can communicate with the Internet. In order to do so, you will need to subscribe to either a commercial on-line service or a community Internet access point (often called a Freenet). As of this writing, the two largest providers of commercial access to Gopher services are Delphi Internet Services and America Online. See Part III of the document series "Joining the On-line Community" for more information.

Action Planning Form

While information and ideas from the videoconference *Technology: New Tools for Adult Literacy* are still fresh in your mind and your attention is still focused on these issues, we urge you to develop an action plan and determine specific follow-up action steps to help you and other staff members move the technology agenda forward within your program. The following questions may help you as you develop an action plan:

- What attitudinal barriers exist within your program that impede the use/increased use of technology? What other barriers exist within your program? What step(s) will you take to attempt to break down these barriers?

- You may not have given much thought to the benefits of using technology with adult literacy students, and/or you may be surprised by some of the benefits you heard about today. What step(s) will you take to further explore the benefits of using technology with adult students in your program?

- What step(s) will you take to increase your own knowledge base about the application of technology to adult literacy?

- What step(s) will you take to continue the creative dialogue on identifying and developing innovative applications of technology?

- What step(s) will you take to address the issue of staff development on technology, within your program? With other adult literacy practitioners in your community?

- What step(s) will you take to address the issue of scarce funding resources? What specific sources of funding will you explore? What ideas will you explore for innovative access to technology and leveraging of financial resources in your area?

TECHNOLOGY: NEW TOOLS FOR ADULT LITERACY

Section II: Reference Materials

Annotated Bibliography of Adult Literacy and Technology Resources

Anderson, J. (1991). *Technology and adult literacy*. New York: Routledge.
Describes the use of educational technology (including radio, television, computers, telephones, satellites, and optical laser discs) in adult literacy programs. Descriptions of the technologies in use are included for print media, audio material supporting print material, radio, video and television, subtitling, computers, drill and practice, simulation programs, word processing, word and text manipulation, story programs, databases, computer peripherals, teleconferencing, optical laser discs, CD-ROM, video disc, and hypermedia. Book concludes by considering emerging issues and the potential of using educational technologies in adult literacy education.

Askov, E. N., & Clark, C. J. (1991). Using computers in adult literacy instruction. *Journal of Reading, 34*(6), 434-48.
Summarizes the advantages of using computers in adult literacy instruction. Presents a matrix permitting teachers to see at a glance how specific software programs may be used. Includes is a list of adult software publishers/distributors in the U.S.

Askov, E. N., & Turner, T. C. (1990). The role of instructional technology in correctional education. *Journal of Correctional Education, 41*(2), 82-85.
Examines the advantages of instructional technology including privacy, individualization, achievement gains, cost effectiveness, flexibility, open-entry/open-exit, and workplace relevance. Also examines the disadvantages including constant change, compatibility, cost, expertise and training requirements, inappropriateness, and change in teacher and learner roles.

Askov, E. N., & Turner, T. C. (1989). Using computers for teaching basic skills to adults. *Lifelong Learning, 12*(6), 28-31.
Explains how using computers allows adults to learn basic skills in new ways and to avoid reliving experiences with frustration, failure, and humiliation that they may have endured as children in school. Includes advantages and disadvantages associated with the use of computers in instruction.

Bredemus, C. T. (1989). Use of computerized speech in reading instruction for adults. *Research in Education for Adult Learners, 1*(2), 16-19.
The article summarizes research at St. Paul Technology for Literacy Center in St. Paul, Minnesota. The goal of the "word of mouth" project was to develop three prototype audio-enhanced instructional modules to teach word attack skills to adults and to study the effectiveness of the courseware.

Clearinghouse on Adult Education and Literacy. (1991). *Technology in the Adult Education Act as amended by the National Literacy Act of 1991*. Washington, DC: U.S. Department of Education, Division of Adult Education and Literacy.
This paper summarizes the portions of the National Literacy Act of 1991 that authorize the use of technology in literacy and adult basic education programs. Areas included are purchase of computer hardware or software, workplace literacy equipment, training and technical assistance to literacy instructors, and research on the use of technology in literacy programs. *Available from: Clearinghouse on Adult Education and Literacy, Division of Adult Education and Literacy, Office of Vocational and Adult Education, U.S. Department of Education, 400 Maryland Avenue, S.W., Washington, DC 20202-7240.*

Eveland, J. D. (1992). *Case studies of technology use in adult literacy programs*. Final Report, Adult Literacy and New Technologies: Tools for a Lifetime. Washington, DC: Office of Technology Assessment, United States Congress. (ERIC Document Reproduction Service No. ED 361497)
A series of sequentially replicated case studies, this study examined the use of information technologies in the context of existing adult literacy programs. Administrators, technical specialists, teachers, and adult learners involved in each program were interviewed to gain information about the features of the technologies used, the contexts in which they are introduced, and factors in integrating new technologies into existing program settings.

Fine, M. F. (1991). Going high tech: Computerized literacy instruction. *Adult Learning, 2*(4), 11-14.
Examines the following considerations for using computers in adult literacy instruction: why use computers; stand-alone versus integrated learning systems; training and supporting teachers in the use of interactive technologies; and outcomes of computer-assisted instruction.

Fleischman, J., & Porter, D. (1993). *Shifting paradigms: Technology and adult education.* Monograph Number One. Washington, D.C.: National Adult Educational Professional Development Consortium.
Report describes the use of technology in adult education programs. Analysis of current and future trends, the implementation of technology into programs, and the benefits and barriers of using technologies.

Imel, S. (1988). *Computer-assisted instruction in adult literacy education.* ERIC Practice Application Brief. Columbus, OH: The Ohio State University, Center on Education and Training for Employment, ERIC Clearinghouse on Adult, Career, and Vocational Education. (ERIC Document Reproduction Service No. ED 296184)
As microcomputers have become more widely available, it has been much more feasible to use computer-assisted instruction (CAI) to increase adults' literacy levels. Computer technology provides alternatives to conventional instructional strategies. This brief summarizes research-based findings on CAI and provides guidelines for effective use of CAI in adult literacy instruction. References are included. *Available from: The Ohio State University, Center on Education and Training for Employment, ERIC Clearinghouse on Adult, Career, and Vocational Education, 1900 Kenny Road, Columbus, OH 43210.*

Kerka, S. (1989). *Communications technologies in adult, career, and vocational education.* ERIC Digest No. 81. Columbus, OH: The Ohio State University, Center on Education and Training for Employment, ERIC Clearinghouse on Adult, Career, and Vocational Education. (ERIC Document Reproduction Service No. ED 305494)
This digest looks at some uses of communication technologies and their effectiveness. It also reviews some of the issues their use poses for adult, career, and vocational educators. *Available from: The Ohio State University, Center on Education and Training for Employment, ERIC Clearinghouse on Adult, Career, and Vocational Education, 1900 Kenny Road, Columbus, OH 43210.*

McLean, Lois. (1985). *Videodiscs in education.* ERIC Digest. Syracuse, NY: Clearinghouse on Information Resources, Syracuse University, School of Education. (ERIC Document Reproduction Service No. ED 270103)
Paper answers the following questions: "What is a videodisc?" "What equipment is required to use videodisc programs?" "What are the educational applications of videodiscs?" "Who is using videodiscs in education?" "How can I learn more about videodiscs in education?" References include organizations, books, periodicals, and journal articles. *Available from: ERIC, Clearinghouse on Information and Technology, Syracuse University, School of Education, Syracuse, New York 13244-2340*

Milheim, W. D. (1993). Using computer-based instruction with adult learners. *Journal of Continuing Higher Education, 41*(3), 2-8.
Explores computer-based training for adults, its usefulness for individuation, cost effectiveness, and interactivity. Argues computer instruction for adults must be designed carefully, considering content organization, learner control, practice, feedback, reinforcement, and assessment.

Miller-Parker, D., & Willing, D. C. (1990). *An examination and evaluation of large computer systems for use in adult basic education programs.* Seattle: Adult Basic and Literacy Educators (ABLE) Network of Washington, Seattle Central Community College.
Report summarizes findings of five integrated learning systems for computer-assisted instruction in adult basic education. The five are CCC (Computer Curriculum Corporation), CCP (Comprehensive Competencies Program), ClassWorks, PLATO, and WICAT. *Available from: Adult Basic and Literacy Educators (ABLE) Network of Washington, Seattle Central Community College, 1701 Broadway, Seattle, WA 98122.*

Miller-Parker, D. (1993). *Instructional technology resource guide for staff development.* Washington, DC: U.S. Department of Education, Division of Adult Education and Literacy, Clearinghouse on Adult Education and Literacy.
This document is intended to serve as a guide for those charged with introducing adult education and literacy service providers to the use of technology in their instructional programs. The guide furnishes practical suggestions that address the concerns of program administrators and instructors. The publication first establishes a rationale for making use of technology an integral part of instruction, then provides a framework for planning and implementing inservices for practitioners. Resources are cited for instructors who are working with learners in regular adult education programs, in English-as-a-Second-Language programs, or with adults who have disabilities. *Available from: Division of Adult Education and Literacy, Office of Vocational and Adult Education, U.S. Department of Education, 400 Maryland Avenue, S.W., Washington, DC 20202-7240.*

Northwest Regional Literacy Resource Center. (1993). *Software buyers guide*. Seattle, WA: Author.
Discusses the evaluation and purchasing of computer software for adult literacy. Includes an annotated listing of software and a review of nine major computer-assisted learning systems. The document concludes with a glossary and list of resources.

Office of Technology Assessment. (1993). *Adult literacy and new technologies: Tools for a lifetime*. Washington, DC: Office of Technology Assessment, United States Congress. (ERIC Document Reproduction Service No. ED 361473)
A review of the nation's literacy problem and the current and potential impact of using technologies in adult literacy programs. Explores promising roles for technology in improving literacy education and it assesses the future role of technology in literacy education. The report is an attempt to identify those capabilities, along with limitations , and outline how new information technologies can be marshaled to meet the goal of a fully literate citizenry. *Available from: the U.S. Government Printing Office, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954 (stock no. 052-003-01330-4, $16).*

Plowman, L. (1991). *Computers and adult literacy education*. ERIC NCLE Minibib. Washington, DC: National Clearinghouse on ESL Literacy Education.
This is an annotated list of two articles and ten documents in the ERIC data base on the subject of educational technology and adult education. *Available from: National Clearinghouse on ESL Literacy Education, An Adjunct ERIC Clearinghouse, 1118 22nd Street, N.W., Washington, DC 20037.*

Plowman, L. (1991). *Educational technology and adult education*. ERIC NCLE Minibib. Washington, DC: National Clearinghouse on ESL Literacy Education.
This is an annotated list of two articles and ten documents in the ERIC data base on the subject of educational technology and adult education. *Available from: National Clearinghouse on ESL Literacy Education, An Adjunct ERIC Clearinghouse, 1118 22nd Street, N.W., Washington, DC 20037.*

Rachal, J. R. (1993). Computer-assisted instruction in adult basic and secondary education: A review of the literature 1984-1992. *Adult Education Quarterly, 43*(3), 165-72.
A review of 12 studies comparing computer-assisted instruction (CAI) and traditional instruction in adult basic and secondary education (ABSE) found that, in 10 of 12, CAI results were at least as good as traditional and CAI also aided retention, self-confidence, privacy, feedback, and faster learning. CAI's place in ABSE is reviewed.

Songer, T. (1992). Why multimedia works: Perspective on literacy courseware. *Literacy Practitioner, 1*(December), 4-6.
Explores new instructional technologies such as interactive videodisc and CD-ROMs that have created opportunities to better understand the preferred learning styles of adult literacy students. The application of learning styles research has shown that the use of clear digital audio is a critical component of well designed adult literacy software. Software with digital audio gives adult learners control over their instruction and has been shown to improve reading and vocabulary skills three times faster than classroom instruction alone. Article concludes with an overview of a five-year research and development project at Central Piedmont Community College in Charlotte, North Carolina which has led to the development of a variety of adult literacy multimedia products.

Spanos, G., & Smith, J. J. (1991). *Closed captioned television for adult literacy learners*. ERIC Digest. Washington, DC: National Clearinghouse on Literacy Education. (ERIC Document Reproduction Service No. ED 321623)
This digest details the uses of closed captioned television for adult Limited English Proficient (LEP) literacy learners. Also included is information about cable TV in general and for ESL elementary students. Sources of more information and references are given. *Available from: National Clearinghouse on Literacy Education, An Adjunct ERIC Clearinghouse, 1118 22nd Street, N.W., Washington, DC 20037.*

Turner, T. C. (1988). An overview of computers in adult literacy programs. *Lifelong Learning, 11*(8), 9-12.
The author discusses current uses of computers in adult basic skills instruction. Compares three primary systems available for purchase in adult literacy instruction: (a) Programmed Logic for Automatic Teaching Operations (PLATO), (b) Computer Curriculum Corporation (CCC), and (c) Principle of the Alphabet Literacy System (PALS). Presents guidelines for making technology purchasing decisions.

Turner, T. C. (1993). *Literacy and machines: An overview of the use of technology in adult literacy programs* (Technical Report 93-3). Philadelphia: University of Pennsylvania, National Center on Adult Literacy. (ERIC Document Reproduction Service No. ED 356408)
Discusses issues related to the use of technology in literacy programs, such as how decision makers can sort through claims made by hardware and software vendors and how scarce resources can be found to purchase technology. The paper also provides a framework for incorporating technology into the curriculum. *Available from: National Center on Adult Literacy, University of Pennsylvania, 3910 Chestnut Street, Philadelphia, Pennsylvania 19010.*

Walker, M. (1993). Integrated learning systems: Purchasing options. *Media and Methods, 30*(1), 12, 14-15.
Discusses the use of integrated learning systems to augment classroom instruction for elementary and secondary education, as well as for adult learners, and describes the software and management components that are offered by eight vendors. Topics addressed include software, graphics, multimedia, remedial learning, and learning environments.

Willetts, K. (1990). *Computer-assisted language learning*. ERIC CLL Minibib. Washington, DC: ERIC Clearinghouse on Languages and Linguistics.
This is an annotated list of eight articles and three documents in the ERIC data base on the subject of computer-assisted language learning. *Available from: ERIC Clearinghouse on Languages and Linguistics, 1118 22nd Street N.W., Washington, DC 20037.*

Willetts, K. (1989). *Technology and second language learning digest*. Washington, DC: National Clearinghouse on Literacy Education. (ERIC Document Reproduction Service No. ED 350883)
Technology is becoming a bigger part of both in-class and home study, as the traditional use of audio and films is supplemented by computer-assisted instruction and interactive media technologies. The digest defines computer-related capabilities for language learning and types of technology-assisted activities.

Young, D., & Irwin, M. (1988). Integrating computers into adult literacy programs. *Journal of Reading, 31*(7), 648-52.
Suggests effective means of integrating computers into adult literacy education using commercial word processing and database programs. Points out that activities used in most "reading software" are not consistent with the cognitive view of comprehension.

Selected Adult Literacy Organizational Resources

American Association for Adult and Continuing Education (AACE)
2101 Wilson Boulevard, Suite 925
Arlington, VA 22201
The American Association for Adult and Continuing Education is a private nonprofit national service organization for professionals in the fields of adult and continuing education.

Association for Community-Based Education (ACBE)
1805 Florida Avenue, N.W.
Washington, DC 20009
The Association for Community-Based Education is a national nonprofit network of member organizations providing alternative education programs linked to the needs, cultures, and traditions of the communities they serve.

The Barbara Bush Foundation for Family Literacy
1002 Wisconsin Avenue, N.W.
Washington, DC 20007
The Barbara Bush Foundation for Family Literacy is a nonprofit volunteer organization that supports the development of family literacy programs.

Center for Applied Linguistics (CAL)
1118 22d Street, N.W.
Washington, DC 20037
The Center for Applied Linguistics is a private nonprofit resource organization that promotes the application of linguistic findings to practical language problems, conducts research and disseminates information on language and linguistics, generates educational materials illustrating various approaches to literacy, and evaluates reading programs and proposed reading tests.

The Center for Children and Technology (CCT)
The Center for Technology in Education (CTE)
Education Development Center, Inc.
96 Morton Street, 7th Floor
New York, NY 10014
The Center for Children and Technology and its affiliate, the Center for Technology in Education, undertake a wide program of basic and applied research.

Clearinghouse on Adult Education and Literacy
United States Department of Education
Division of Adult Education and Literacy
400 Maryland Avenue, S.W.
Washington, D.C. 20202-7240
The United States Department of Education's Department of Adult Education and Literacy Clearinghouse periodically publishes a *Bibliography of Resource Materials* which lists articles and reports that deal directly with state-administrated and community-based adult education programs. Publications in the *Bibliography* include articles, fact sheets, directories of resources, literacy materials, and papers on selected subjects. Single copies of the *Bibliography of Resource Materials* can be obtained free of charge by writing to: Tammy Fortune or Rickie Gallmon at the above address.

ERIC Clearinghouse on Adult, Career, and Vocational Education
Ohio State University
1900 Kenny Road
Columbus, OH 43210-1090
An ERIC clearinghouse that provides information on adult literacy and adult literacy technology, as well as reports and digests on adult, career, and vocational education.

ERIC Clearinghouse on Information and Technology
4-194 Center for Science and Technology
Syracuse University
Syracuse, NY 13244-4100
An ERIC clearinghouse that provides information on educational technology and library and information science.

Institute for the Study of Adult Literacy (ISAL)
The Pennsylvania State University
College of Education
204 Calder Way, Suite 209
University Park, PA 16801-4756

The Institute for the Study of Adult Literacy was established to promote a coherent and systematic means to respond to the problems and issues related to literacy. Three major concerns of the institute are study and research, improvement of practice, and advocacy and leadership.

National Center for Family Literacy (NCFL)
Waterfront Plaza, Suite 200
325 West Main Street
Louisville, KY 40202-4251

The National Center for Family Literacy is a nonprofit corporation that focuses its efforts on family literacy problems. The Center provides training materials, reports, and a newsletter.

National Center on Adult Literacy (NCAL)
University of Pennsylvania
3910 Chestnut Street
Philadelphia, PA 19104-3111

The National Center on Adult Literacy heads a national initiative that focuses on research and development in adult literacy. The Center sponsors innovative research, works with practitioners to improve instruction, and gives decision makers the tools to make sound policy decisions. Information from the field is disseminated through newsletters, technical reports, conferences, policy forums, a literacy technology laboratory, and the Internet.

National Clearinghouse on ESL Literacy Education
Center for Applied Linguistics
1118 22nd Street, N.W.
Washington, D.C. 20037

An adjunct ERIC clearinghouse that provides information on adult literacy and adult literacy technology, as well as reports, monographs, and digests on literacy education.

National Demonstration Laboratory for Interactive Information Technologies
The Atrium
Madison Building, Library of Congress
101 Independence Avenue, S.E.
Washington, D.C. 20504

The National Demonstration Laboratory for Interactive Information Technologies (NDL) is a nonprofit demonstration center of interactive video software and technology. Located at the Library of Congress, the NDL is open to all interested visitors by appointment.

National Institute for Literacy (NIFL)
800 Connecticut Avenue, N.W., Suite 200
Washington, DC 20202-7560

Established by the National Literacy Act of 1991. The Institute is an interagency group that assists federal agencies in policy, awards grants, and provides technical assistance to programs in adult literacy.

United States Department of Education
Division of Adult Education and Literacy, Program Services Branch
400 Maryland Avenue, S.W.
Washington, D.C. 20202-7240

A source of information and services pertinent to programs administered by the Office of Vocational and Adult Education.

United States Department of Education
Technology Resource Center
80 F Street, N.W.
Washington, D.C. 20208

A demonstration center within the Department of Education designed to serve teachers and education professionals by showing them how new technology works. The Center provides opportunities to gain hands-on experience. The Center offers tours, lectures, and demonstrations upon request.

Funding Resources for Adult Literacy and Technology

This document provides information on private and federal funding sources that may be available for adult literacy programming and technology implementation.

A large number of corporations, charitable organizations, foundations, and industry groups are active in providing funds to literacy providers to encourage innovative practices and support existing programs. It has been estimated that during the past five years more than $1 billion has been made available from thousands of private sources to advance adult literacy both in the community and in the workplace.

Private Funding

There is one very good resource for researching private foundations. The Foundation Center, with headquarters in New York City, is a national nonprofit organization that offers information on foundation and corporate philanthropic giving. The Center collects, organizes, and disseminates data through publications and a nationwide network of more than 190 Cooperating Collections. Cooperating Collections house a core group of Foundation Center publications and a variety of supplemental resources. The Collections are located throughout the United States and offer free public access. To find the nearest Cooperating Collection call 1-800-424-9836.

The Foundation Center also offers foundation directories, publications, an on-line database, and a membership program that, for a fee, helps in your search for dollars. The most comprehensive and commonly used publication is *The Foundation Directory*. The directory compiles data for 6,000 private foundations in the United States and covers all 50 states.

There are other resources that list new funding opportunities as they become available. One of the best sources is the *Chronicle of Philanthropy*. It is published bimonthly and records recent foundation giving on a national basis.

Most grants made by foundations are local in nature. By making your local community, civic, and religious organizations aware of specific needs, you may be able to secure funds for new technologies from a local foundation or corporation. It is best to begin your search for money in your own community. Let groups, individuals, corporations, and local foundations know that small amounts of money can go a long way towards providing new technological solutions. Organizations and individuals can often fund a new computer or a piece of software that will help with your literacy mission, but very few can provide long-term operating support.

In short, don't be afraid to ask. Be specific when you ask. Prove you have pressing needs. Articulate the projected outcomes and benefits of technology implementation, and be prepared to show your local foundations and organizations how your ideas will benefit the community.

Federal Funding

The best resource for accessing information about federal funding programs is the *Federal Register*, which is available at most public libraries. A second source is the U.S. Department of Education's "ED Board." The ED Board is a computer bulletin board at the Grants and Contracts Service Division of the U.S. Department of Education. The Division is responsible for broadcasting information about ED's grants and contracts. Most of the information on ED Board can be displayed or downloaded to your personal computer via modem. ED Board is available free of charge to anyone with a computer and a modem; it is not available in paper format. The log-in process requires no special codes or pre-registration; you simply dial the ED Board modem number (202) 260-9950. If you require technical assistance or want more information about ED Board, call George Wagner at (202) 708-7811.

The following pages contain information about federal programs from four agencies that are funding innovative proposals to improve adult literacy in the United States. Federal agencies are becoming more open to funding the purchase of technological solutions –if the proposal can demonstrate how technology can make a difference.

A phone number has been included for the office responsible for operating the grant program listed. In addition, the estimated appropriation for FY 1994 is included to give you an idea of the dollar amount available for each of these programs. At the time these figures were compiled, final budgeting amounts had yet to be agreed upon by Congress. However, actual amounts will generally approximate the information listed.

NOTE: Not all programs listed below are open for direct grant applications to the federal government. Many require application at the state level. Please contact your state literacy director.

Adult Education for the Homeless

Program supports states in the provision of basic skill remediation and literacy training for homeless adults. The goal of the program is to improve the level of education of homeless people in order to reduce their dependency on others. FY '94 estimate: $10 million (Awards to states; program grants through state office)
U.S. Department of Education
Office of the Assistant Secretary for Vocational and Adult Education
(202) 732-2251

Adult Education State-Administered Basic Grant

Basic Grant Program helps states improve existing adult education programs and establish new ones. Emphasis is placed on basic skills, literacy, secondary school completion, and job training. FY '94 estimate: $261.5 million (Awards to states; program grants through state office)
U.S. Department of Education
Office of the Assistant Secretary for Vocational and Adult Education
(202) 732-2251

Bilingual Vocational Training Program

Program provides financial assistance to projects which provide both occupational skills instruction and job-related English-as-a-second-language instruction to limited-English speaking adults and out-of-school youth. FY '94 estimate: $2.25 million
U.S. Department of Education
Office of the Assistant Secretary for Vocational and Adult Education
(202) 732-2251

National Workplace Literacy Partnerships Program

Program provides financial assistance for demonstration programs that serve adults who are deficient in basic skills. The program objectives are to improve the workforce by improving the literacy level of workers and to upgrade the skills of workers as the workplace changes. FY '94 estimate: $22 million
U.S. Department of Education
Office of the Assistant Secretary for Vocational and Adult Education
(202) 732-2251

Vocational Education Basic Grants to States

This program assists states in developing, expanding, and improving vocational education programs. Emphasis is placed on traditionally underserved populations such as the handicapped, adults in need of training or retraining, single parents, homemakers, and incarcerated people. FY '94 estimate $964.5 million. Title III Grants go to community-based organizations (Awards to states; program grants through state office)
U.S. Department of Education
Office of the Assistant Secretary for Vocational and Adult Education
(202) 732-2251

Even Start–State Education Agency

Program assists local education agencies in providing family-centered education projects that encourage parents to participate in their children's education. This program also supports family literacy activities for parents. FY '94 estimate: $102.3 million
U.S. Department of Education
Office of the Assistant Secretary for Elementary and Secondary Education
(202) 401-0113

Even Start–Migrant Education Program

Program serves children of migrant agricultural workers through integrating early childhood and adult education into a unified program.
FY '94 estimate: $2.7 million
U.S. Department of Education
Office of the Assistant Secretary for Elementary and Secondary Education
(202) 401-0113

Indian Education–Adult Indian Education

The Adult Indian Education Program plans, develops, and implements programs for Indian adults in order to decrease the rate of illiteracy, increase the mastery of basic skills, increase the number of recipients of high school diplomas, and encourage the development of programs relevant to the culture and heritage of Indian adults. FY '94 estimate: $1.5 million

U.S. Department of Education
Office of the Assistant Secretary for Elementary and Secondary Education
(202) 401-0113

State Literacy Resource Centers

Each state is eligible to receive grants to assist state and local, public, and private nonprofit efforts to eliminate illiteracy. Local educational agencies, volunteer organizations, community-based organizations, and nonprofit entities are eligible recipients for competitive contracts. Emphasis is placed on basic skills instruction. FY '94 estimate: $7.9 million (Selection made through state governors' offices)

U.S. Department of Education
Office of the Assistant Secretary for Vocational and Adult Education
(202) 732-2251

Literacy For Incarcerated Adults

Project grants are available to state and local correctional agencies from the Functional Literacy for Prisoners Program and the Life Skills for Prisoners Program. The objectives are to help each person incarcerated in a prison, jail, or detention center to achieve functional literacy and to reduce prisoner recidivism through increased life skills. FY '94 estimate: $5.1 million

U.S. Department of Education
Division of National Programs, Office of Vocational and Adult Education
(202) 732-2251

Administration for Children, Youth, and Families–Head Start

Head Start provides health, educational, nutritional, social, and other services to economically disadvantaged children in order to break the cycle of poverty. Adult education and family literacy activities are allowed under Head Start. FY '94 estimate: $2.851 billion

U.S. Department of Health and Human Services
Administration for Children and Families
(202) 472-7257

Job Opportunities and Basic Skills Program (JOBS)

JOBS Program provides Aid to Families with Dependent Children (AFDC) recipients with education, job training, work activities, and support services that facilitate self-sufficiency. FY '94 estimate: $825 million

U.S. Department of Health and Human Services
Administration for Children and Families
(202) 472-7257

Refugee and Entrant Assistance–State-Administered Programs

Program subsidizes state assistance for refugee resettlement. English language training is an allowable activity under this program. FY '94 estimate: $233.8 million

U.S. Department of Health and Human Services
Office of Refugee Resettlement
(202) 401-9255

State Legalization Impact Assistance Grants (SLIAG)

As part of the 1986 amnesty program for illegal aliens, SLIAG reimburses state and local governments for the costs associated with provision of public, health, and educational assistance to legalized resident aliens. For adults in this population, funds may be used for any educational activities allowable under the Adult Education Act. FY '94 estimate: $812 million

U.S. Department of Health and Human Services
Office of Refugee Resettlement
(202) 401-9255

Job Training Partnership Act (JTPA, Title II)

Program provides job training and related assistance to economically disadvantaged individuals who face significant employment barriers. The ultimate goal of the act is to move trainees into permanent, self-sustaining employment. All funds from JTPA Title II are distributed directly to the governor of each state. FY '94 estimate: $670.6 million
U.S. Department of Labor
Employment and Training Administration
(202) 535-0577

Employment and Training Assistance–Dislocated Workers (JTPA, Title III)

Program assists dislocated workers in obtaining unsubsidized employment through training and related employment services. Services include classroom training, on-the-job training, retraining, supportive services, and relocation assistance. FY '94 estimate: $566.6 million
U.S. Department of Labor
Employment and Training Administration
(202) 535-0577

Job Corps (JTPA, Title IV-B)

Job Corps assists economically disadvantaged youths, ages 16 through 22, in improving their educational proficiencies and job-related skills. Services include classroom training, vocational education, and counseling. Positive outcomes include acceptance into other job training programs or the U.S. Armed Forces. FY '94 estimate: $825 million
U.S. Department of Labor
Employment and Training Administration
(202) 535-0577

Appalachian State Research Technical Assistance and Demonstration Projects

These projects provide funds for research, technical assistance, and demonstration projects that expand knowledge of the Appalachian region. Literacy projects are an approved use of funds to carry out the goal of the Commission. The Appalachian region stretches from New York to Mississippi. Call the Commission if you think your county is eligible.
FY '94 estimate: Not determined as of 11/1/93, but project will be funded.
Appalachian Regional Commission: (202) 673-7842

Appalachian Vocational and Other Education Facilities and Operations

Program provides people of the Appalachian region with services that support the training and education needed to secure employment. Funds may also be used for the purchase of equipment, renovation of educational facilities, and demonstration projects. The Appalachian region stretches from New York to Mississippi. Call the Commission if you think your county is eligible.
FY '94 estimate: Not determined as of 11/1/93, but project will be funded.
Appalachian Regional Commission: (202) 673-7842

Parts of this list were excerpted from the following publication:

Alamprese, Judith A. & Hughes, Donna. *Study of Federal Funding Sources and Services for Adult Education. Phase I: Preliminary Report,* COSMOS Corporation, Washington, D.C., October 1990.

Joining the On-line Community
Part I: An Overview

For years one of the most common concerns in the field of adult literacy has been the lack of interaction between the research, policy, and practitioner communities. With the emergence of new computer networks, like the Internet, commercial on-line services, and community freenets, the opportunity to bridge this divide is at hand.

The on-line community now connects millions of people to one another. It is best described as an electronic city where thousands of people visit regularly to exchange mail, trade ideas, conduct business, or just chat. Its impact has been compared to the invention of movable type.[1] This guide will give you a brief introduction to various aspects of the on-line community and will provide you with information about organizations and companies which provide access to the community.

In The Beginning...

The largest and oldest component of the on-line community is the Internet. The Internet was originally developed out of the research efforts of the Department of Defense (DoD) and National Science Foundation (NSF). NSF, tasked with developing a network capable of allowing university researchers to share time on their five supercomputers, began developing the Internet in the early 1980s. To facilitate data sharing, NSF used DoD computer protocols which were designed to allow any computer, regardless of manufacturer, to communicate with the supercomputers. Once a common language was established, professors and students found a variety of other uses for the network, beginning with electronic mail. As new uses developed, more and more universities and corporations joined, first in the United States and later world-wide. At last count, more than five million computers in forty countries were connected to the Internet.

The Internet has grown to support dozens of information services, but five have become ubiquitous: e-mail, library and database gateways, bulletin boards, software distribution, and an emerging technology called "Gopher."

E-Mail

E-mail is the most popular service on the Internet because, unlike regular mail, delivery and reply are both prompt and reliable. Like a telephone answering machine, e-mail allows the user to store and retrieve messages any time of day. Unlike any other form of electronic communications, the content is textual, allowing large amounts of data to be transmitted.

Library and Database Gateways

One of the most popular uses of Internet is to log onto electronic card catalogs or research databases. Approximately 350 major universities, public libraries, and government agencies, including the Library of Congress, allow Internet users access to their electronic card catalogs and databases. Users can search the databases, retrieve text (and, in some cases, graphics), and save the results to their own computer.

Bulletin Boards

The Internet hosts the world's largest electronic bulletin board, known as USENET. Currently, USENET hosts more than 3,000 discussions on topics ranging from the sublime to the ridiculous to the highly unusual. Currently, there are no discussion groups specifically for adult literacy practitioners or policymakers. However, there are several groups on education in general and specifically on educational technology.

Software Distribution

Increasingly, the Internet has become a channel through which software is distributed. Using a program called FTP, users can log onto computers that serve as archives for DOS, Windows, Macintosh, or UNIX software, search the archive for a specific program or for a program which fills a specific need, and then have a copy of the program placed on their hard drive or diskette. Most software is free (freeware) or offered at low cost (shareware), and all programs may be "test driven" before final purchase.

Gopher

Most Internet services are not well known or well publicized; Gopher solves this problem. The University of Minnesota has developed software which integrates the "gateways" and FTP services into one program known as Gopher (after Minnesota's Golden Gophers). Gopher is unique because it offers a directory of Gopher servers, collectively known as Gopherspace. In addition, Gopher allows users to search all of the servers in Gopherspace for information on a given topic or for a specific piece of software.

NCAL has recently joined Gopherspace by setting up its own server. NCAL distributes many of its documents via Gopher, including this issue and back issues of NCAL Connections. NCAL's research documents and papers as well as

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information on adult literacy conferences are also available. NCAL's Gopher can also point you to other Gopher resources relevant to adult literacy.

Accessing the Internet

"Great," you are thinking, "how do I try it?" Unfortunately, accessing the Internet is still problematic because there are few publicly available access points. However, here are a few routes:

Colleges and Universities

Most universities, many community colleges, and some public libraries and corporations offer direct (i.e., 24 hour-a-day, nonmodem) access to the Internet. If you have access to computer facilities at one of these organizations, ask the network or lab administrator if the facility is Internet-capable. If so, the administrator should also be able to configure your computer for Internet operations and provide you with the relevant software. Much of the software needed to access Internet resources is available free of charge.

Modem Access to Internet

For the modem dependent, do not despair; a number of options are available. First, twenty communities already provide free or low-cost Internet access, although many of these services do not offer the full range of Internet services. In addition, several telecommunications vendors are offering modem access to the Internet at prices comparable to those charged by the major commercial on-line services. See Part III of this document series for more information on modem access providers.

Commercial On-line Services

Commercial on-line services were not originally part of the Internet; in fact, they started as small, independent on-line communities. However, as the Internet grew and users demanded the ability to communicate between different services providers (i.e., Compuserve members wanted to be able to e-mail America Online and Internet users), they began to provide their users access to the Internet.

Connecting to a commercial on-line service is easy. Many local computer stores sell low-cost sign-up kits, and a few commercial services offer their sign-up kits for free. Installation and use is relatively trouble-free and straightforward.

In addition to Internet access, commercial on-line vendors offer services and information for both professional and personal use. Some services cater to education, while others are geared towards industry, personal productivity, or entertainment. A few offer services related to adult literacy. See Part II of this paper for a review of the five largest commercial on-line services.

In conclusion, policymakers and researchers are now exploring new ways to connect the Internet community to the adult literacy community. As the Internet becomes a common part of our business and personal life, the opportunities for using this technology in adult literacy will only expand.

Endnotes

[1]Broad, William J. "Doing Science on the Network: A Long Way From Gutenberg." *The New York Times.* May 18, 1993, C1.

Joining the On-line Community
Part II: A Review of Major Commercial On-line Services

During the early 1980s, when the Internet was still primarily the domain of university researchers and Defense Department technocrats, several small companies were also beginning to build computer networks to facilitate human communication and information exchange. Generically called bulletin board services (BBSs, also called "boards"), these computer networks were built to exploit the existing telephone networks and the power of personal computers. Anyone with a personal computer, a modem, terminal emulation software, and a telephone line could join these networks. For those unfamiliar with computers or networking, a modem is a device which allows two computers to exchange information over a regular telephone line. Terminal emulation software controls the modem and allows the user to send information to and from the BBS's computer. Today, pioneering BBSs like CompuServe have evolved into multi-billion dollar companies offering a wide variety of communication and information services.

What's on the Board?

The BBSs, like the Internet, started out as the domain of the computer experts, in part because the boards were so difficult to use. However, three developments encouraged BBS providers to widen their audience. First, businesses became interested in using the boards to communicate with distant offices via e-mail. Second, information providers came to view the boards as an efficient way to provide access to their databases and data services. Finally, the explosive growth of personal computer use generated consumer demand for electronic information and services.

As a result, the boards have striven to make their services "user friendly" and to diversify their information offerings. Most now employ a graphical user interface (GUI) instead of terminal emulation software. GUIs use icons and pull-down menus to help users navigate the service. America Online (AOL), CompuServe, and Prodigy provide GUIs for the Macintosh, IBM-compatible computers running Microsoft Windows, and IBM-compatibles running Microsoft DOS. Delphi and GEnie plan to provide GUI software for their services in early 1994.

BBSs are now primarily known for their business and travel services –most allow users to monitor stocks and order airline tickets from their computer. However, a number of interesting educational services are becoming available on BBSs. For example, most BBSs offer an on-line encyclopedia, the ability to search databases like those maintained by the Educational Resource and Information Centers (ERIC), and discussion groups on education-related topics (although most are devoted to K-12 topics). Most BBSs also allow users to transfer free or low cost software from their main computer –everything from "gradebook" type programs to Spanish-English electronic flashcard sets. More innovative are the courses offered by the Computer Assisted Learning Center (CALC) via GEnie's service. CALC offers GED-preparation courses which integrate text-based learning with on-line instruction, tutoring, and drill. AOL maintains a topic area on adult literacy which includes discussion groups and a regular on-line chat about adult literacy on Monday evenings. In addition, AOL offers on-line job counseling, resume review, and study improvement courses.

The BBSs have also responded to the growing popularity of Internet information resources. The five largest services now allow their members to e-mail Internet users, and two services offer users access to the most popular Internet information resources (Delphi and AOL). See the descriptions below for more information.

Getting on the Boards

Joining a service has never been easier or cheaper. Before joining a bulletin board, you will need to purchase a modem. Modems are generally rated by their speed, measured in bits per second (bps) or baud per second (baud rate), and their compatibility with Hayes Microcomputer's AT modem command set. Hayes compatibility is a must; if the modem isn't Hayes compatible, it is probably best not to buy it. Most BBS software packages will not work with modems which are incompatible with the Hayes AT commands. Modem speed determines how much information a modem can transfer. In the last year modems rated at 9600 bps or 14,400 bps have become more affordable, although 2400 bps modems will work with all of the services. If you can afford a 9600 or 14,400 bps modem, spend the extra money; transferring a large report or program using a 2400 bps modem can be maddeningly slow. If you do buy a high-speed modem, make sure to register for the BBS's high speed service.

Most BBSs provide the necessary software free of charge when you register. Listed below are the numbers and trial offers available from the five largest services as of December 1993. The listings also highlight the BBS's adult literacy and general education services.

As the information super-highway develops over the next ten years, commercial services will undoubtedly be transformed, much as the Internet's popularity has forced the boards to provide a gateway to Internet. But for the next few years, BBSs will probably offer the cheapest, most user-friendly "on-ramp" to cyberspace.

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Reprinted from the February 1994 edition of *NCAL Connections*

List of On-line Services:

America Online
8619 Westwood Center Drive
Vienna, VA 22182-2285
(800) 827-6364
Interfaces: GUI (Mac, Windows, DOS)
Transfer rates: 300-9600 baud
Trial Offer: Free trial kit for one month or 5 hours of usage.
Pricing: Flat fee of $9.95 per month for up to 5 hours or usage. Additional hours: $3.50, pro-rated by the minute. No additional fees for e-mail or Internet services.
Internet: E-mail currently; Gopher, USENET, and WAIS currently available, though still under development. FTP and Telnet will be available in 1994.
Information services:
- •Topic area devoted to adult literacy; includes a conference list, discussion groups, and live chat on Mondays at 7:30 ET. Used extensively by Literacy Volunteers of America.
- •Grants bulletin board (primarily K-12 information)
- •Free/low cost software libraries
- •Career counseling (users may also contact counselors by phone)
- •Writing courses taught by university faculty (business English, resume writing, short reports, creative writing)
- •Language studies
- •Homework and teacher consultations (primarily for K-12 students and faculty)
- •Study improvement service
- •Non-credit university courses
- •Discussion groups on substance abuse, special education, physical disabilities
- •Information/reviews of computer software

CompuServe
P.O. Box 20212
Columbus, OH 43220
(800) 368-3343 ext 35
Interfaces: GUI (Mac, Windows, DOS)
Transfer rates: 300-9600 baud (14,400 baud available in some areas)
Trial offer: $25 for materials, refundable if returned after 30 days, plus one month/5 hours free usage.
Pricing: $25 one time fee for the materials; $8.95 per month. CompuServe levies a surcharge of $.15 per minute for some services and charges $.15 per e-mail message after the first 60 messages which are sent or received.
Internet: E-mail only
Information services:
- •Teacher and student forums (K-12 primarily)
- •Science and math education forum (K-12 primarily)
- •Educational research discussion group
- •Educational Resource and Information Center (ERIC) database access
- •IQuest database search system (800 databases; $9 surcharge)
- •Knowledge Index database search system (100 databases; weekend and evenings only; 40 cents/minute for searches)
- •Books in Print database
- •Access to selected government publications and data (including some grant funding announcements)

Delphi Internet Service
1030 Massachusetts Avenue
Cambridge, MA 02138-5302
(800) 695-4005
Interfaces: Text menus only. GUI to be available in early 1994.
Transfer rates: 300-2400 baud
Trial offer: Five-hour free trial. User must have a terminal emulation program (ProComm for DOS and Windows and MicroPhone II for the Macintosh are the most widely used)
Pricing: Delphi offers two packages: $10 per month flat fee for 4 hours usage; or $20 per month for 20 hours of usage plus a one-time fee of $19. Regardless of plan, Delphi charges $3/month for Internet access.
Internet: E-mail, Gopher, WAIS, FTP, Telnet, and USENET news currently available.

Information services:
- •ERIC resources (via Internet)
- •Encyclopedias
- •Dialog database service
- •Federal Register
- •Disabilities discussion group (WIDnet)

GEnie - The GE Network for Information Exchange
GE Information Services
401 N. Washington St. - MC05A
Rockville, MD 30850
(800) 638-9636
Interfaces: Text menus only currently; a GUI for Mac and Windows will be available by Spring 1994.
Transfer rates: 300-2400 baud
Trial offer: GEnie does not offer a general trial offer. However, if asked, the service representative will offer whatever introductory specials are currently being offered.
Pricing: $8.95 for the first four hours of service between the hours of 6 pm and 8 am Monday through Friday and anytime during the weekend. Additional time is available for $3 per hour. There is a $9.50 surcharge for calls between 8 am and 6 pm.
Internet: E-mail directly; one may also request programs or documents from GEnie's "Internet group." GEnie is planning to offer full Internet access in 1994.
Information services:
- •GED preparation, English reading and writing, basic math instruction offered by CALC (Computer-Assisted Learning Center)
- •Job search advice/resume writing review
- •ERIC databases
- •Dialog databases services
- •Encyclopedias
- •Discussion groups on GED preparation, ESL, school-to-work transition, and general adult education
- •Discussion groups on configuring, using, and servicing computers for beginner and intermediate level computer users
- •Software archives

Prodigy Interactive Personal Services
Prodigy Services Company
P.O. Box 8667
Gray, TN 37615-0667
(800) 776-3552, ext 518
Interfaces: GUI (Mac, Windows, DOS)
Transfer rates: 300-9600 baud; 14,400 baud in early 1994.
Trial offer: One month free.
Pricing: $14.95 per month for unlimited use of the core services. Plus services (i.e., airline reservations, stock quotes, etc.) are an additional $3.95 per hour.
Internet: E-mail only currently.
Information services:
- •Encyclopedias
- •Discussion groups on adult education, with one topic area devoted to adult literacy.
- •Software archives
- •Discussion groups on configuring and using computers

Joining the On-line Community
Part III: A Guide to Internet Access Providers

Introduction

Despite the growing popularity of the Internet as a telecommunication tool, finding a service provider that offers individuals or organizations access to the Internet is still not easy. Using the Internet, NCAL has compiled the following list of access providers. For more information about the Internet and on-line communities in general, see Part I of this document series.

To utilize any of these services you will need to have, at minimum, the following equipment: a personal computer and a modem (a device that allows computers to exchange data with one another via plain phone lines). Modems come in different speeds; modem speed is usually expressed either in bits per second (bps) or baud rate (both of which measure the amount of data a modem can transfer in one second). Baud rate and bits per second are roughly synonymous. Most people use 2400 bps modems; however, 9600 and 14,400 bps modems are becoming cheaper and are preferable for accessing the Internet.

You may also need terminal emulation software (software that controls the modem and coordinates communication between your computer and the computer on the other end of the phone line). The most popular terminal emulation programs are ProComm for DOS and Windows-based computers and Microphone II for Macintosh computers. However, many commercial services provide terminal emulation software with their service, so consult your service provider before purchasing a package.

There are three types of Internet service providers: Freenets, commercial services, and regional Internet providers. Each offers different types of services.

Freenet Providers:

As the name implies, Freenets are free or very low cost community access points to the Internet. Each Freenet site provides Internet e-mail accounts for their registered users and a variety of community-oriented on-line services – everything from bulletin boards to library card catalogs. Additionally, some sites offer access to Internet data and navigation tools such as Gopher, WAIS, FTP, and Telnet. Although these services usually focus their content on one community, anyone may join, regardless of location. Those living outside a Freenet's "home" community will have to pay long distance charges to gain access to the system and may have to pay a higher account fee.

Commercial Dial-up Access to the Internet:

There are three types of commercial services: Dial-up e-mail, dial-up IP, and dial-up Internet. Services that offer dial-up e-mail, as the name suggests, provide only e-mail access to the Internet. While one may access a growing number of databases via e-mail requests, e-mail-only accounts do not offer access to the more powerful Internet tools like Gopher, Telnet, or WAIS. However, you may access dial-up e-mail accounts using a simple terminal emulation program. Dial-up IP accounts offer full access to all the Internet's tools and data sources. You may need to acquire special modem software to use dial-up IP. Check with your service provider for more details. Both "e-mail only" and IP providers usually have local access numbers for their services in metropolitan areas of 50,000 to 100,000 people. Dial-up Internet accounts are a hybrid: they offer full Internet access, but you do not need special software to access the account. The most prominent examples of this type of account are America Online and Delphi. Many commercial providers offer other services in addition to Internet access –anything from on-line stock quotes to airline ticket reservation services. The list below only highlights the type of Internet access a provider offers. See Part II of this document series for a review of the five largest commercial access providers.

Regional Internet Providers:

The regional Internet providers are primarily responsible for connecting institutional local area networks (LANs) to the Internet. If you wish to connect your instutition's LAN to the Internet, you will need to contact one of the providers listed below. Regional providers can help you determine what level of service and what type of equipment you will need to buy. However, the regional providers can also steer individuals toward dial-up service providers. In fact, some offer dial-up access directly (those that do are listed in the commercial dial-up list). If you have trouble determining what type of service you need and where to get it, the regional provider for your area is your best resource.

This list is current as of March 1994. If you know of or discover a service that should be listed here, please contact Karl Rethemeyer at NCAL (E-mail: rethemeyer@literacy.upenn.edu; phone: (215) 898-2100). Currently, the InterNIC, an organization created by the National Science Foundation to help groups and individuals get connected to and use the Internet, is compiling a comprehensive list of service providers. NCAL will update this list as the InterNIC's information becomes available. The InterNIC also provides information about the Internet and the various ways to join the Internet community. For more information about the InterNIC and its services, call 800-444-4345 between 6 AM and 6 PM Pacific Time.

Author: R. Karl Rethemeyer, National Center on Adult Literacy, University of Pennsylvania

The National Center on Adult Literacy and the University of Pennsylvania neither supports nor endorses the organizations listed below.

Freenet Providers:

Note: "Demo" sites may not be available to the public yet or may not offer some of the services mentioned above. Contact the service provider for information on service availability.

BIG SKY TELEGRAPH
Community: Dillon, Montana
Contact Person: Frank Odasz
Western Montana College of
the University of Montana
Dillon, MT 59725
Phone: (406) 683-7338
E-mail: franko@bigsky.dillon.mt.us
Access number: (406) 683-7680
(1200 baud)
Telnet Access: 192.231.192.1 (not receiving guest telnet connections currently)

BUFFALO FREE-NET
Community: Buffalo, New York
(Demo System)
Contact Person: James Finamore
Town of Tonawanda
1835 Sheridan Drive
Buffalo, NY 14223
Phone: (716) 877-8800, ext. 451
E-mail: finamore@ubvms.cc.buffalo.edu
Access Number: (716) 645-6128
Telnet Access: freenet.buffalo.edu

CAPACCESS: THE NATIONAL CAPITAL AREA PUBLIC ACCESS NETWORK
Community: Washington, DC
Address: The George Washington
University
2002 G. Street, Suite B-1, NW
Washington, DC 20052
Phone: (202) 994-4245
Fax: (202) 994-2317
E-mail: info@cap.gwu.edu
Access number: (202) 785-1523
300/1200/2400/9600/14400 Baud
Telnet Access: cap.gwu.edu

THE CLEVELAND FREE-NET
Community: Cleveland, Ohio
Contact Person: Jeff Gumpf
CWRU Information
Network Services
Cleveland, Ohio 44106
Phone: (216) 368-2982
E-mail: jag@po.cwru.edu
Access Number: (216) 368-3888 - 300/1200/2400 Baud
Telnet Access: freenet-in-a.cwru.edu

COLUMBIA ONLINE INFORMATION NETWORK (COIN)
Community: Columbia, Missouri
Address: COIN
Daniel Boone Regional Library
P.O. Box 1267
100 West Broadway
Columbia, MO 65205-1267
Phone: (314) 443-3161
E-mail: ccwam@mizzoui.missouri.edu
Access Number: (314) 884-7000
300/1200/2400 Baud
Telnet Access: bigcat.missouri.edu

DENVER FREE-NET
Community: Denver, Colorado
Contact Person: Drew Mirque
4200 East Ninth Ave.
Campus Box C-288
Denver, CO 80210
Phone: (303) 270-4300
E-mail: drew@freenet.hsc.colorado.edu
Access Number: (303) 270-4865
Telnet Access: freenet.hsc.colorado.edu.
Login: guest.

THE HEARTLAND FREE-NET
Community: Peoria, Illinois
Contact Person: Karen Eggert
Lovelace Technology Center
Peoria, Illinois 61625
Phone: (309) 677-2544
E-mail: xxadm@heartland.bradley.edu
Access Number: (309) 674-1100
Telnet Access: heartland.bradley.edu

ITHACA FREENET
Community: Ithaca, New York
Contact Person: Jean Currie
215 North Cayuga Street
Ithaca, NY 14850
Phone (607) 273-9106
E-mail scrlc@scrlc.org
Organizing committee to establish Ithaca Freenet. Service not yet available.

LORAIN COUNTY FREE-NET
Community: Elyria, Ohio
Contact Person: Thom Gould
32320 Stony Brook Drive
Avon Lake, Ohio 44012
Phone: 1-800-227-7113, ext. 2451
or (216) 277-2451
E-mail: aa003@freenet.lorain.oberlin.edu
Access Number: (216) 366-9721
300/1200/2400 Baud
Telnet Access: freenet.lorain.oberlin.edu.
Login: guest.

MEDINA COUNTY FREE-NET
Community: Medina, Ohio
Contact Person: Gary Linden
Medina Gen. Hosp Project Director
Medina General Hospital
1000 E. Washington Street
P.O. Box 427
Medina, Ohio 44258-0427
Phone: (216) 725-1000, ext. 2550
E-mail: aa001@medina.freenet.edu
Access Number: (216) 723-6732
300/1200/2400 Baud
Telnet Access: (not receiving guest telnet connections currently)

NATIONAL CAPITAL FREE-NET
Community: Ottawa, Canada
Contact Person: David Sutherland
Computing Services
Carleton University
Ottawa CANADA K1S 5B6
Phone: (613) 788-2600, ext. 3701
E-mail: aa001@freenet.carleton.ca
Access Number: (613) 780-3733
Telnet Access: freenet.carleton.ca

RIO GRANDE FREENET
Community: El Paso, Texas; Juarez, Mexico, and the Upper Rio Grande
Contact: Don Furth
P.O. Box 20500
El Paso Community College
El Paso, TX 79998
Phone: (915) 594-2190
E-mail: aa100@rgfn.epcc.edu
Access Number (915) 775-5600
300/1200/2400/9600 baud
Telnet Access: rgfn.epcc.edu

SENDIT
Community: North Dakota educators
Phone: (701) 237-8109
E-mail: sackman@sendit.nodak.edu
Telnet Access: sendit.nodak.edu

TALAWANDA LEARNING COMMUNITY NETWORK
Community: Oxford, Ohio
Contact Person: Robert Pickering
331 West Church Street
Oxford, OH 45056
E-mail: rap@tlcnet.muohio.edu
Access Numbers:
(513) 529-6114 (2400 baud)
(513) 529-4999 (9600 baud)
Telnet Access: tlcnet.muohio.edu

TALLAHASSEE FREE-NET
Community: Tallahassee, Florida (Demo System)
Contact Person: Hilbert Levitz
Dept. of Computer Science
Florida State University
Tallahassee, FL 32306
Phone: (904) 644-1796
E-mail: levitz@cs.fsu.edu
Access Number: (demo system, Internet access only)
Telnet Access: freenet.fsu.edu (not receiving guest telnet connections currently)

TRAVERSE CITY FREE-NET
Community: Traverse City, Michigan
Contact Person: Connie Minster
Northwestern Michigan College
Information Technology Department
Traverse City Free-Net
1701 East Front Street
Traverse City, MI 49684
E-mail: connie@nmc.edu
Telnet Access: leo.nmc.edu

TRISTATE ONLINE
Community: Cincinnati, Ohio
Contact Person: Michael King
TSO System Administrator
Cincinnati Bell Directory, Inc.
Room 102-2000
201 East 4th Street
Cincinnati, Ohio 45201-2301
Phone: (513) 397-1396
E-mail: sysadmin@cbos.uc.edu
Access Number: (513) 579-1990
Telnet Access: cbos.uc.edu.
Select option CBOS

VICTORIA FREE-NET
Community: Victoria, British Columbia
Contact Person: Gareth Shearman
Victoria Free-Net Association
C/O Vancouver Island Advanced
Technology Centre (VIATC)
Suite 203-1110 Government Street
Victoria, British Columbia V8W 1Y2
CANADA
Phone: (604) 385-4302
E-mail: shearman@cue.bc.ca
Access Number: (604) 595-2300
Telnet Access: freenet.victoria.bc.ca

VIRGINIA PUBLIC EDUCATION NETWORK
Community: Educators in Virginia
Address: Virginia Department of Education
James Monroe Building
22nd floor
101 North 14th Street
Richmond, VA 23216
Telnet Access: vdoe386.vak12ed.edu

THE YOUNGSTOWN FREE-NET
Community: Youngstown, Ohio
Contact Person: Lou Anschuetz
YSU Computer Center
Youngstown, Ohio 44555
Phone: (216) 742-3075
E-mail: lou@yfn.ysu.edu
Access Number: (216) 742-3072 - 300/1200/2400 Baud
Telnet Access: yfn.ysu.edu (not receiving telnet connections currently)

Other Dial-up Services Free to Practitioners with K-12 Affiliations:

K12Net
3501 County Road
Stanley, NY 14561
Contact: Jack Crawford
Phone: (716) 526-6431
TeachNet

New York Institute of Technology
Central Islip Campus
Building 66, Room 205
Central Islip, NY 11722
Contact: Barbara Zayes
Phone: (516) 348-3317; (800) 462-9041

Commercial Dial-up Access to the Internet:

a2i Communications
E-mail: info@rahul.net
Area Served: San Jose, CA
(408 area code)
Services: Dial-up e-mail

America On-line, Inc.
Phone: (800) 827-6364
E-mail: info@aol.com
Area Served: US and Canada
Services: Dial-up Internet

Anterior Technology
Phone: (415) 328-5615
E-mail: info@radiomail.net
Area Served: San Francisco bay area
Services: Dial-up e-mail

The Black Box
Phone: (713) 480-2684
E-mail: mknewman@blkbox.com
Area Served: Area code 713 (Houston, TX)
Services: Dial-up E-mail

BIX
Phone: (800) 695-4775
(617) 354-4137
E-mail: TJL@mhis.bix.com
Area Served: Area code 617; local dial-up connections outside 617 available through TYMNET.
Services: Dial-up e-mail

CERFnet
Phone: (800) 876-2373
(619) 455-3900
E-mail: help@cerf.net
Services: Network connections, national dial-up IP, dial-up e-mail

Capcon Connect
Phone: (202) 466-7057
E-mail: jhagerman@capcon.net
Area Served: Area code 202.
Services: Dial-up e-mail, Dial-up IP

Channel 1
Phone: (617) 864-0100
E-mail: whitehrn@channel1.com
Area Served: Massachusetts
Services: Dial-up e-mail

CLASS
Cooperative Agency for Library Systems and Services
Phone: (800) 488-4559
E-mail: class@class.org
Area Served: US
Services: Dial-up access for libraries in the US

Community News Service
Phone: (719) 579-9120
E-mail: klaus@cscns.com
Area Served: Colorado Springs, CO (719 area code)
Services: Dial-up e-mail

CompuServe Information System
Phone: (800) 848-8990
(614) 457-0802
E-mail: postmaster@csi.compuserve.com
Services: Dial-up e-mail

The Cyberspace Station
Phone: (619) 944-9498, ext. 626
E-mail: help@cyber.net
Area Served: San Diego, CA
Services: Dial-up e-mail

DASNET
Phone: (408) 559-8649
E-mail: postmaster@das.net
Area Served: California
Services: Dial-up e-mail

Delphi Internet Services, Inc.
Massachusetts Avenue
Cambridge, MA 02138
Contact: Rusty Williams
Phone: (800) 544-4005
Area Served: US
Services: Dial-up e-mail, dial-up IP, dial-up Internet

Express Access Online Communications Service
Phone: (301) 220-2020
E-mail: info@digex.com
Services: Dial-up e-mail in the Northern VA, Baltimore MD, Washington, DC areas (area codes 202, 310, 410, 703)

EZ-E-Mail
Phone: (603) 672-0736
E-mail: info@lemuria.sai.com
Area Served: US and Canada
Services: Dial-up e-mail

Halcyon
Phone: (206) 426-9298
E-mail: info@remote.halcyon.com
Area Served: Seattle, WA
Services: Dial-up e-mail

HoloNet
Phone: (510) 704-0160
E-mail: info@holonet.net
Area Served: Berkeley, CA (area code 510)
Services: Dial-up e-mail

Institute for Global Communications (IGC)
Phone: (415) 442-0220
E-mail: support@igc.apc.org
Services: Dial-up e-mail; affiliated with PeaceNet, EcoNet, and ConflictNet; member of the Association for Progressive Communications (APC)

IDS World Network
Phone: (401) 884-7856
E-mail: sysadmin@ids.net
Area Served: East Greenwich, RI; northern RI
Services: Dial-up e-mail, dial-up IP

JvNCnet
Contacts: Sergio F. Heker
Allison Pihl
Phone: (800) 358-4437
(609) 258-2400
E-mail: market@jvnc.net
Services: Network connections, national dial-up IP, dial-up e-mail

MCI Mail Engineering
Phone: (800) 444-6245
(202) 833-8484
E-mail: 2671163@mcimail.com
3248333@mcimail.com
Area Served: U.S.
Services: Dial-up e-mail

MichNet
Contact: Jeff Ogden
Phone: (313) 764-9430
E-mail: jogden@merit.edu
Area Served: Michigan
Services: Dial-up IP

Milwaukee Internet X
Phone: (414) 962-8172
E-mail: sysop@mixcom.com
Area Served: Milwaukee area
Services: Dial-up e-mail

MindVox
Phone: (212) 988-5987
E-mail: info@phantom.com
Area Served: New York City (area codes 212, 718)
Services: Dial-up e-mail

MSEN, Inc.
Contact: Owen Scott Medd
Phone: (313) 998-4562
E-mail: info@msen.com
Area Served: U.S.
Services: Network connections, dial-up IP, dial-up e-mail

New Mexico Technet
Phone: (505) 345-6555
E-mail: reynolds@technet.nm.org
Area Served: New Mexico
Services: Dial-up e-mail

Net Access
Contact: Avi Freedman
Phone: (215) 960-0972
Access Number: (215) 836-4832
(offers free demo account)
Area Served: SE Pennsylvania, Southern New Jersey, Delaware
Services: Dial-up e-mail; dial-up Gopher, Telnet, etc.

Netcom Online Communications Services
Phone: (408) 554-8649
E-mail: info@netcom.com
Area served: San Jose-San Francisco, CA
Services: Dial-up e-mail, dial-up IP

Old Colorado City Communications
Phone: (719) 632-4848
E-mail: dave@oldcolo.com
Area Served: Colorado
Services: Dial-up e-mail

Panix Public Access Unix
Contact: Alexis Rosen
Phone: (212) 877-4854
E-mail: alexis@panix.com
or
Contact: Jim Baumbach
Phone: (718) 965-3768
E-mail: jsb@panix.com
Area Served: New York City, NY (area codes 212, 718)
Services: Dial-up e-mail

Performance Systems International, Inc. (PSI)
Phone: (800) 827-7482
(703) 620-6651
E-mail: info@psi.com
Services: Network connections, dial-up IP, dial-up e-mail

Portal Communications, Inc.
Phone: (408) 973-9111
E-mail: cs@cup.portal.com
info@portal.com
Area Served: Northern California (area codes 408, 415)
Services: Dial-up e-mail

RISCnet
Contact: Andy Green
Phone: (401) 885-6855
E-mail: info@nic.risc.net
Area served: Rhode Island
Services: Dial-up IP

Seattle Online
Phone: (206) 328-2412
E-mail: bruceki@online.com
Area Served: Seattle, WA
Services: Dial-up e-mail

Sugar Land Unix
Phone: (713) 438-4964
E-mail: info@NeoSoft.com
Area Served: Texas (Houston metro area)
Services: Dial-up e-mail

UUNET Technologies, Inc.
Phone: (800) 488-6384
(703) 204-8000
E-mail: info@uunet.uu.net
Services: Network connections, dial-up e-mail; Alternet is a product of UUNET Technologies.

Village of Cambridge
Phone: (617) 494-5226 (voice)
(617) 252-0009 (modem)
E-mail: service@village.com
Area Served: Massachusetts
Services: Dial-up e-mail

Whole Earth 'Lectronic Link (WELL)
Phone: (415) 332-4335
E-mail: info@well.sf.ca.us
Area Served: San Francisco Bay Area (area code 415)
Services: Dial-up e-mail

The WORLD
Software Tool & Die
1330 Beacon Street
Brookline, MA 02146
Phone: (617) 739-0202
Fax: (617) 739-0914
E-mail: office@world.std.com
Access Number: (617) 739-9753
Area Served: U.S.
Services: Dial-up e-mail, dial-up IP

Regional Internet Providers:

Advanced Network and Services Inc. (ANS)
Phone: (800) 456-8267
(313) 663-2482
E-mail: info@ans.net
Region: nationwide

BARRNET
Pine Hall Room 115
Stanford, CA 94305-4122
Contact: William Yundt
Phone: (415) 723-3104
E-mail: GD.why@forsythe.stanford.edu
Region: San Francisco area

BBN Systems and Technologies
10 Moultin Street
Cambridge, MA 02138
Phone: (617) 873-8730
E-mail: nearnet-join@nic.near.net
Region: Maine, New Hampshire, Vermont, Connecticut, Rhode Island, Massachusetts

CERFnet
PO Box 85608
San Diego, CA 92186-9784
Phone: (800) 876-2373
E-mail: help@cerf.net
Region: Southern California

CICnet
ITI Building
2901 Hubbard Drive, Pod G
Ann Arbor, MI 48105
Phone: (313) 998-6103
E-mail: infor@cic.net
Region: Illinois, Iowa, Minnesota, Wisconsin, Michigan, Ohio, Indiana

Colorado Supernet
CSM Computer Center
Colorado School of Mines
1500 Illinois Street
Golden, CO 80401
Phone: (303) 273-3471
E-mail: info@csn.org
Region: Colorado

CONCERT
PO Box 12889
3021 Cornwallis Road
Research Triangle Park, NC 27709
Phone: (919) 248-1404
E-mail: jrr@concert.net
Region: North Carolina

Infolan
Contact: George Abe
Phone: (310) 335-2600
E-mail: abe@infonet.com
Region: nationwide

INet
Contact: Dick Ellis
Phone: (812) 855-4240
E-mail: ellis@ucs.indiana.edu
Region: Indiana

JVNCNet
6 von Neumann Hall
Princeton University
Princeton, NJ 08544
Contact: Sergio Heker
Phone: (609) 258-2400
E-mail: market@jvnc.net
Region: Northeastern US

Los Nettos
Information Sciences Institute
4676 Admiralty Way
Marina Del Rey, CA 90292
Phone: (301) 822-1511
E-mail: los-nettos-request@isi.edu
Region: Los Angeles area

Merit
2200 Bonisteel Boulevard
Ann Arbor, MI 48109-2112
Phone: (313) 764-9430
E-mail: jogden@merit.edu
Region: Michigan

MichNet
Contact: Jeff Ogden
Phone: (313) 764-9430
E-mail: jogden@merit.edu
Region: Michigan

MIDnet
29 WESC
University of Nebraska
Lincoln, NE 68588
Phone: (402) 472-5032
E-mail: dmf@westie.unl.edu
Region: Nebraska, Oklahoma, Arkansas, South Dakota, Iowa, Kansas, Missouri

MRnet
511 11th Avenue South, Box 212
Minneapolis, MN 55415
Phone: (612) 342-2570
E-mail: info@mr.net
Region: Minnesota

MSEN
628 Brooks Street
Ann Arbor, MI 48103
Phone: (313) 998-4562
E-mail: info@msen.com
Region: nationwide (Michigan primarily)

NSFNET
Referrals from:
InterNIC Information Services
Phone: (800) 444-4345
(619) 455-4600
E-mail: info@internic.net
Region: nationwide

NEARnet
Netcom Online Communications Services
4000 Moorepark Avenue, #209
San Jose, CA 95117
Phone: (408) 554-8649
E-mail: ruthann@netcom.com
Region: California

netIllinois
Bradley University
1501 W. Bradley Avenue
Peoria, IL 61625
Contact: Joel Hartman
Phone: (309) 677-3100
E-mail: joel@bradley.edu
Region: Illinois

NevadaNet
University of Nevada System
Computer Services
4505 Maryland Parkway
Las Vegas, NV 89154
Phone: (702) 739-3557
Region: Nevada

NorthWestNet
2435 233rd Place, NE
Redmond, WA 98053
Phone: (206) 562-3000
E-mail: ehood@nwnet.net
Region: Oregon, Washington, Wyoming, Alaska, Idaho, Montana, North Dakota

NYSERNet
200 Elwood Davis Road
Suite 103
Liverpool, NY 13088-6147
Phone: (315) 453-2912
E-mail: info@nysernet.org
Region: New York

OARnet
Ohio Supercomputer Center
1224 Kinnear Road
Columbus, OH 43085
Phone: (614) 292-9248
E-mail: alison@osc.edu
Region: Ohio

PACCOM
Contact: Torben Nielsen
Phone: (808) 956-3499
E-mail: torben@hawaii.edu
Region: Hawaii

PREPnet
305 S. Craig Street, 2nd Floor
Pittsburgh, PA 15123
Phone: (412) 268-7870
E-mail: twb+@andrew.cmu.edu
Region: Pennsylvania

PSCNet
Pittsburgh Supercomputing Center
305 S. Craig Street, 2nd Floor
Pittsburgh, PA 15123
Phone: (412) 268-4960
E-mail: hastings@psc.edu
Region: Eastern US
Performance Systems International, Inc (PSI)
Phone: (800) 827-7482
(703) 620-6651
E-mail: info@psi.com
Region: nationwide

RISCnet
Contact: Andy Green
Phone: (401) 885-6855
E-mail: info@nic.risc.net
Region: Rhode Island

SDSCnet
Contact: Paul Love
Phone: (619) 534-5043
E-mail: loveep@Ssds.sdsc.edu
Region: California

Sesquinet
Office of Networking and Computing
Rice University
Houston, TX 77251-1892
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E-mail: farrell@rice.edu
Region: Texas

SprintLink
Contact: Bob Doyle
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E-mail: bdoyle@icm1.icp.net
Region: nationwide

SURAnet
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8400 Baltimore Boulevard
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Phone: (301) 982-4600
E-mail: info@sura.net
Region: Southeastern US & Puerto Rico

THEnet
Texas Higher Education Network
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Austin, TX 78712
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E-mail: info@nic.the.net
Region: Texas

VERnet
Academic Computing Center
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WESTnet
601 S. Howes Street, 6th Floor South
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Region: Arizona, Colorado, Idaho, New Mexico, Utah, Wyoming

World dot Net
Internetworks, Inc.
Phone: (206) 576-7147
E-mail: info@world.net
Region: Idaho, Oregon, Washington

WiscNet
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Getting the Most From Your Computer Network Service: Finding and Using Low-cost Computer Software

Introduction

One of the most popular features of both commercial on-line services and the Internet is the ability to retrieve "ready-to-use" software from electronic archives. Most archives provide two types of software. The first is called freeware. As the name implies, freeware is available free of charge to anyone who can download it (i.e., copy the program from the archive's hard disk to the user's hard disk). The second type is called shareware. Shareware is made available by amateur and professional programmers on the honor system: you download the program to your computer, try it for a few days, and then either send payment to the author or remove the program from your hard drive. Almost all network service providers maintain software archives, and there are several huge, publicly available archives on the Internet.

Finding the Archives

The range and variety of archives you will be able to access depends largely on who provides your network service. If you have an account with GEnie, Prodigy, Compuserve, or any other bulletin board which does not offer access to the Internet, you will only be able to access the software archives provided by those services. However, anyone with Internet access (including those with America Online [AOL] and Delphi accounts) will be able to access both Internet archives and archives provided by the service (like AOL's education software archive). Most of the services prominently advertise their archive of shareware and freeware. Check the documentation which came with your service's start-up kit for more information on finding its software archive and for instructions on how to download software from the archive to your computer.

Internet archives may be accessed using a variety of tools. The most popular and easy to use is Gopher. The Gopher system allows users to find information resources by navigating through a series of menus. Unlike other systems, the information resources are named for real institutions rather than using cryptic computer names. The University of Minnesota, developer of Gopher, maintains a list of Gopher servers around the world, sorted alphabetically and by geographic location. Several bulletin board services, including AOL and Delphi, offer access to Gopher through their service. Contact your service provider for more information on using their Gopher access software.

Below is a list of several Internet software archives which may be accessed using Gopher. These archives offer a wide range of programs –from system utilities to games to gradebook utilities and courseware.

Internet Archives Available through Gopher

The archives listed below may be accessed through the Gopher system. To find them, log into the Home Gopher. The servers marked with an asterisk (*) are found in the folder/directory "Internet file server (ftp) sites." All others may be found by first selecting the "Other Gopher and Information Servers" directory. Within this folder, you will find another folder/directory entitled "All Gopher Servers in the World." This folder/directory contains the alphabetical list of all the Gopher servers world-wide; scroll down the list until you find the server you want to visit.

NOTE: Some of the servers listed below are difficult to gain access to during business hours because of high usage.

Outreach and Technical Assistance Network (OTAN)

OTAN, a bulletin board system developed in cooperation with the State of California specifically for adult literacy practitioners, maintains an archive of Macintosh freeware and shareware for adult literacy. In addition, OTAN is developing an archive of demonstration software provided by major adult literacy software vendors.

MERIT Software Archives (University of Michigan)*

MERIT's archive contains more than 5,000 programs for Apple II, DOS, Windows, Macintosh, Atari, Amiga, and Apollo computers. The MERIT archive also "mirrors" (contains a complete backup copy of) the SUMEX-AIM archive and the WUarchive, so logging into this resource gets you three archives in one.

Grind Filesystem (University of Iowa)*

The Grind Filesystem is maintained by student volunteers at the University of Iowa. It offers more than 5 gigabytes (5 billion bytes) of freeware and shareware. The largest offerings are for the Mac and IBM platforms (both DOS and Windows); however, they also have a substantial archive of Apple II and Amiga software.

Info-Mac/SUMEX-AIM Archive (Stanford University)

Many consider Info-Mac to be the forerunner of all Macintosh archives. Because of this notoriety, it is often very difficult to gain access to Info-Mac; the administrators restrict the number of people who can sign on simultaneously. Thus you will probably have better results trying to log onto the mirror sites at MERIT or the WUArchive.

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WUArchive (Washington University)*

Like Info-Mac, the WUArchive is considered the antecedent of all IBM-compatible archives on the Internet. In addition, the WUArchive also mirrors several other sites, including Info-Mac and the University of Indiana Windows Archive.

National Center for Supercomputing Applications (NCSA)*

While NCSA does not offer the full range of software that the other archives listed here do, it is the purveyor of some of the newest and most interesting network information retrieval tools and several science-related utilities and information databases. NCSA also maintains downloadable lists of education-related e-mail services.

Getting Your Freeware or Shareware Up and Running

Once you have downloaded a piece of software, there are a couple of steps you will probably need to take in order to use the software. First, make sure to protect against infection of your computer by a virus (a program which tries to alter or delete information stored on your hard drive). The vast majority of freeware and shareware is virus free, but it is always a good idea to have a virus protection program installed before using your new software. If you don't already have a virus protection program, the first thing you might want to download is one of the free protection programs available on the Internet or through your network service.

There are two free virus protection tools on the network: Disinfectant for the Mac and FP for DOS and Windows. Disinfectant may be retrieved from any of the Macintosh archives listed above. FP is available via Gopher from the Purdue University Computer Science Department Gopher (arthus.cs.purdue.edu). Other popular commercial packages include SAM for the Macintosh from Symantec, Inc. and Vi-Spy for DOS and Windows from RG Software.

The next step is to check whether the software has been compressed. A file or program is considered "compressed" when it has been run through compression software that rewrites the file or program so that it takes up less space on the archive's hard disk. However, once compressed, the software is no longer in the "language" the computer understands. Consequently, once you download a compressed program or file, you must decompress it before using it.

You can tell whether a program has been compressed by checking several attributes of the program. First, many compressed files have a three letter extension added to their name. For instance, an application name like "program.sit" indicates that the software has been compressed using a Mac shareware program called StuffIt! The extension ".sea" indicates that the file has been compressed in a manner that allows it to be decompressed by simply executing the file (or by double clicking on it in the Macintosh or Windows environment). Listed below is a chart of extensions that indicate a file is compressed, the type of computer on which the compressed file or program is usually used, and the program used to compress the file or program. Although all of these programs are used on the Internet archives and major bulletin board services, StuffIt! for the Macintosh and PKZip and WinZip for DOS and Windows are by far the most popular programs.

Extension	Platform	Program
sit	Macintosh	StuffIt!
cpt	Macintosh	Compactor Pro
sea	Macintosh, DOS/Windows	Self extracting (do not need a program to uncompress)
pit	DOS/Windows	PackIt II, PackIt III
zip	DOS/Windows	PKZip, Unzip
arc	DOS/Windows	Arc
gzip	DOS/Windows	GNU Zip
zoo	DOS/Windows	Zoo
Z	Unix (sometimes DOS/ Windows and Macintosh)	Unix COMPRESS
shk	Apple II	ShrinkIt

NOTE FOR MACINTOSH AND APPLE II USERS: Many Mac and Apple II files have either a .hqx, .bsc, or .bsq extension. These extensions do not indicate that the program has been compressed. Instead, the files have been changed from binary data (1's and 0's) to alpha-numeric characters. This is done to ensure that transmission of the program over the Internet and some types of bulletin board services does not destroy the special structure of Mac and Apple II data. Many Mac and Apple II download programs automatically convert the file from alpha-numeric data back to binary data when you retrieve a program or file. However, if you should download a piece of software but find that the file you get is a word processor document filled with hundreds of lines of characters which make no sense, then you will have to manually convert the alpha-numeric data back to binary data using a decoder. On the Mac, the most commonly used decoder is called BinHex 4.0. It is available from all of the

major software archives. On the Apple II, the decoder is called BINSCII. It is available from the MERIT archive listed above.

Once you have decoded the software, you may still have to decompress it using the decompression programs listed above.

Finally, you should test the downloaded software with the existing configuration of your computer. As you probably know, new software can conflict with existing pieces of software installed on your system. Since freeware and shareware are often written by new or amateur programmers, there is a somewhat higher chance that they will conflict with existing software. It is always a good idea to test freeware and shareware for a little while before using them as integral parts of your instructional or administrative program.

In Conclusion

The vitality of the freeware/shareware system is dependent on users providing financial incentives for new developers to enter the market. Please do your part: pay for shareware promptly.

CD-ROM Sources of Free or Low-cost Software

Introduction

Although the number of people with access to the Internet and other electronic networks grows daily, there are still large numbers of people who cannot access electronic software archives on the Internet or commercial on-line services. Recognizing this problem, several organizations have combed the Internet and commercial services for the best freeware and shareware and put the fruits of their search on CD-ROM. Listed below are several popular titles for Mac, DOS, and Windows software. The shareware rules for commercial services and the Internet apply to the shareware on CD-ROM: you can test the software on your machine for several days and then must either pay for the software or remove it from your hard drive.

Freeware/Shareware CDs

Title:	Classroom CD-ROM
Publisher:	Educorp
Distributor:	Educorp 7434 Trade Street San Diego, CA 92121
Telephone:	1-800-843-9497
Format:	Macintosh
Price:	$89

Description: This CD-ROM is divided into three educational levels: 8 years old and younger, 8 to 12 years old, and 12 years old through college. Many of the programs were created with HyperCard; some of the programs will "crash" because they were written with earlier versions of HyperCard and/or the Macintosh operating system.

Title:	The BMUG PD-ROM version B
Publisher:	BMUG, Inc.
Distributor:	BMUG, Inc. 1442A Walnut Street Berkeley, CA 94709
Telephone:	1-510-549-2684
Format:	Macintosh
Price:	$65

Description: The most up-to-date and complete collection of publicly distributable software available anywhere. All files are System 7.1 compatible and 32-bit clean. Contains over 600 megabytes of great shareware and freeware, including fonts, games, utilities, and more.

Title:	Best of Shareware
Publisher:	Wayzata
Distributor:	Educational Resources 1550 Executive Drive Elgin, IL 60123
Telephone:	1-800-624-2926
Format:	DOS, Windows, Macintosh
Price:	$41.95

Description: Over 1,000 of the best hand-selected, rated, and categorized shareware programs available. Categories include games, databases and word processing. More than thirty categories in all.

Title:	MACnificent 7.1
Publisher:	Wayzata
Distributor:	Educational Resources 1550 Executive Drive Elgin, IL 60123
Telephone:	1-800-624-2926
Format:	Macintosh
Price:	$41.95

Description: Contains 465 megabytes of System 6.x and System 7 tested games and educational shareware, including a vast encyclopedia of information about programs, descriptions, reviews, ratings, hints, tips, and compatibility reports. Uses menu program called The Librarian which provides easy access to programs, including search/find and cross-referencing features.

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Office of Educational Research and Improvement (OERI)
Educational Resources Information Center (ERIC)

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